Informatics

AN e-GOVERNANCE PUBLICATION FROM NATIONAL INFORMATICS CENTRE

Digital India
Power To Empower

In Focus

eCourts
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Integrated Financial
Management System (IFMS) ◄

PFMS-Pension (e-PPO) ◄

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Blockchain Technology ◄

एनआईसी
NIC

EDITORIAL

A nation's legal system is the reflection of social, political, economic and cultural characteristics of the society. It plays an instrumental role in building the belief of citizens, and ultimately the way they look upon various issues that may pertain to them or the entire country. Judiciary is also equally significant and comes under the entire gamut of citizen-centric services considered for an effective governance. The successful deployment of ICT has channelized the development of a comprehensive system to help streamline legal processes and enable citizens to access information about cases at Indian courts. This issue of INFORMATICS brings to you an informative *Cover Story* on NIC's eCourts Services.

Knowledge upgradation and enhancement are integral to individual as well as organizational growth. Engaged in the preparation and execution of various projects for the Government of India, NIC remains at the forefront of acquainting its Officers with novel methodologies to evolve with emerging scenarios. The *Spotlight* section of this issue features a story on workshop on Software Project Execution Approach organized for Senior Officers at the NIC Headquarters.

NIC e-Governance projects in the State of Madhya Pradesh have been focused in *From the States* section. *District Informatics* section highlights ICT advancements in Kurukshetra District of Haryana, Vellore District of Tamil Nadu and Koraput District of Odisha. Articles covered in the *e-Gov Products & Services* section are Integrated Financial Management System, PFMS-Pension (e-PPO) and e-Nirvachan. *Appscape* details latest Apps introduced for citizens and specific authorities. *Accolades, International e-Gov Update* and *In The News* sections also bring to you some interesting reads as always.

We constantly strive towards offering a happy reading experience to our readers. Your support in the form of suggestions and feedback will be highly appreciated. Please do write to us.

Editor

CONTENTS

Software Project Execution Approach Workshop at NIC

Fostering adaptability to a uniform approach in project development and execution

tion of project proposals, was successfully organized by the Technical Advisory Group (TAG) of NIC at the Headquarters in Delhi on 20th & 27th April and 04th May 2019. The workshop was attended by all the HoDs posted at NIC HQ.

The participants were mainly apprised of the importance of various aspects like GudApps Guidelines, Software Deployment Architecture, Performance Evaluation, Quality Assurance, Roles and Responsibilities of Various Stakehold-

Workshop in progress

National Informatics Centre (NIC), being the digital arm of the Government of India, has been immensely involved in the preparation of proposal, design, development, execution and maintenance/support of various projects for the Central Government, State Government and District Administration. Taking into account the increasing need of the user

departments, ever growing data usage and issues being faced during maintenance phase, a need was observed to introduce a uniform project execution approach for NIC.

In this backdrop, an interactive workshop on "Software Project Execution Approach for NIC", focussing on the necessity of adapting to a standardized approach for the preparation and execu-

ers, Terms of Use etc., that need to be taken into consideration while preparing a project proposal. They were also assigned with a group activity to present a project of their choice, in accordance with the facts discussed during various sessions of the workshop.

With inputs from
TAG SUPPORT TEAM, NIC

MADHYA PRADESH

Pacing up with technological advancement to lead ICT transformation for efficient e-Governance

Edited by
AK DADHICHI

NIC Madhya Pradesh, "The Cyber Gateway of the State", was set up in Bhopal in 1988 to play a catalytic role in promoting informatics culture and providing ICT services to Government Departments and Organizations. The roads from rich historical past are passing by the present developing State and beautifully converging into the futuristic digital highway of the country, marking the State's prominent contribution to e-Governance.

Madhya Pradesh, a large state in central India, fondly called 'Hindustan Ka Dil', retains its landmarks from eras throughout the Indian history. The State is one of the sought-after destinations for tourists who seek pleasure in exploring its rich art and culture, historical sites, national parks, nature reserves and much more.

Since its inception in the State, NIC has been relentlessly working towards fostering better e-Governance for the authorities. The NICNET Infrastructure in the State is equipped with high-end technology products and solutions like Enterprise Routers in Clustering Mode for High Availability, L2/L3 Manageable LAN Switches, MPLS enabled 10 Gbps Backbone Connectivity, a Gigabit OFC based Inter-Building LAN connecting Vidhan Sabha, Mantralaya, & Directorates housed at Satpura & Vindhyachal Bhawan.

There are 51 District Centres with 1 Gbps/ 34/ 100 Mbps LL connectivity and a robust infrastructure. Inter-district connectivity at 14 Districts and Redundant Leased Line Connectivity from alternate National Long Distances (NLDs) at 20 District locations are ably supporting e-Governance efforts. The Internet Data Centre at the State Centre is running 56 Servers & 29 TB SAN Storage. Web hosting services are being provided on Cloud Environment under NIC National Cloud Services (MeghRaj), including NIC-MP State Cloud.

The video conferencing facility is being used extensively by senior functionaries of the government as it is an excellent medium of communication for face-to-face interaction with field level functionaries and Central Government officials.

An MoU was signed between the State Government and NIC in January 2015 for the use of NIC mail by all the State Government functionaries. Around 50,000 email accounts are being maintained.

ICT Initiatives in the State

A plethora of e-Governance systems / initiatives are making a mark, owing to the remarkable contribution of NIC to the State. Following are some of the digital reforms that have taken place in various sectors.

Education Sector

• **Education Portal** is a common integrated portal for all stakeholders. It is a suite of e-Governance applications to streamline and automate core functions of the education sector. Mobile Apps, m-Shiksha Mitra and My-College Mates have also been

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> I am happy to learn that e-Governance in our country including Madhya Pradesh has steadily evolved. To promote computerization at Governor's Office, a new dynamic website has been developed. Various office activities such as online registration for common citizens to visit the Raj Bhavan, e-file movements, computerization of Governor's Discretionary Grant System, library automation etc., are running successfully through NIC MP. To ensure punctuality of employees of the Rajbhavan Secretariat, Aadhaar-based BAS has been implemented. To monitor various activities of the State Universities, VC is going to be implemented soon. I hope and trust that NIC will continue to contribute significantly to the field of e-Governance. My best wishes.
>
> **ANANDI BEN PATEL**
> **Hon'ble Governor**
> **Government of Madhya Pradesh**

Education portal of the State

Panch Parmeshwar Portal

developed. The Mission One Click initiative of the Department has facilitated the automation of processes involved in implementation of 30 scholarship schemes being run by 9 different departments for school students. The Right to Education (RTE) Portal facilitates seat allotment in about 30000 private schools as per RTE Norms.

- **Scholarship Portal:** Post Matric Scholarship is a common integrated platform for different departments. It is running for three schemes (SC, ST & OBC). It is an end-to-end portal for application of scholarship, its verification and sanctioning to its disbursal to the students' bank accounts.

- **e-Pravesh Portal:** This initiative facilitates the automation of processes involved in the online counselling for admissions in over 5000 UG & PG courses being offered by over 1100 colleges of Madhya Pradesh.

- **Smart Classes:** Project VIDYA (Video Interactive Didactics for Your Awareness) has a huge repository of sessions in Hindi. It requires a desktop machine with camera, multimedia kit and Internet connectivity. The functional coverage includes 313 schools and 100 colleges of Madhya Pradesh.

- **National Knowledge Network:** 71 Institutes are connected including MP SWAN (State Wide Area Network), SDC (State Data Centre) and 18 NMEICT (National Mission in Education through ICT) Links. NICNET has been integrated with MP SWAN at State and District Headquarters level.

Smt. Rashmi Arun Shami, Principal Secretary, School Education, states, "The e-Gov Solutions for Education Sector have helped the department in monitoring student learning and transformed core business processes, brought in transparency in operations, and enforced accountability".

Health Sector

- **e-Hospital:** It is a generic workflow-based Health Management Information System (HMIS), which addresses all major functional areas of a hospital. Presently, the MP instance of eHospital is hosted at Meghraj Cloud of NIC New Delhi with 67 hospitals onboarded across the State.

- **Health Information System for Central Bureau of Health Intelligence (CBHI):** It is a web-based MIS for collection, compilation, analysis and dissemination of information on a broad range of indicators related to health status and health services in the country.

- **MedLEaPR MP:** It is a web-based reporting system that captures Medico Legal Report and Post Mortem Report prepared by doctors.

- **Rashtriya Bal Swasthya Karyakram (RBSK):** It is an initiative aimed at early identification and intervention for children from birth to 18 years to cover 4 Ds, viz. defects at birth, deficiencies, diseases and development delays including disability. An online application is developed for the same.

"Implementation of eHospital in the State is a step forward in the generation of electronic health record for 24X7 health services. Hospital management has become more transparent and patient centric. Implementation of MedLEaPR MP has resulted in overcoming the difficulty in understanding the MLR/PMR during the court proceedings", says Dr. Pallavi Jain Govil, Principal Secretary, Health, Government of Madhya Pradesh (GoMP).

Rural Sector

- **Panch Parmeshwar Portal:** It is a suite of web and Mobile Applications that help Panchayat Raj Institutions (PRIs) to conduct their operations online in a transparent and rule-based manner, thereby aiding the State Government. The dissemination of all the key information related to receipts of funds/ revenue, financial transactions, works, bank statements of panchayat bank account, vendors and

> " I am delighted to know about the valuable contribution of NIC towards strengthening of IT-enabled governance. Good governance is the sole objective of the State Government as it is an effective instrument to improve the quality of life. NIC has not only helped the State Government to develop and practise innovative e-Governance, but has also brought about digital awakening among the masses. Transparent, reliable and participatory governance helps establish a citizen friendly work culture. I wish NIC a grand success in all its endeavors and appreciate its deep commitment towards improving the digital delivery of public services.
>
> **KAMAL NATH**
> **Hon'ble Chief Minister**
> **Government of Madhya Pradesh**

payment receivers etc., is done in public domain. It has been implemented at 22,816 Gram Panchayats, 313 Janpad and 51 Zilla Panchayats of the State.

- **Swachh MP Portal:** It is a web-based system to facilitate the sanction and disbursal of incentives for construction of toilets.

- Other projects implemented in the Rural Sector are Mahatma Gandhi National Rural Employment Guarantee Act, Indira Awaas Yojna, Pradhan Mantri Gramin Awaas Yojana (PMGAY), PriaSoft, AwaasSoft, Action Soft and Plan Plus.

Social Sector

- **Samagra:** It has facilitated an integrated e-Governance platform to facilitate implementation of social security schemes from a single point. An integrated database of families and individuals with detailed has been prepared covering the entire State. Allied portals for State population register, BPL register and Shramik register have been developed and maintained. 9 Schemes from social security pensions and assistance have been started on the Samagra platform, National Family Benefit Scheme has been integrated, and 30 School

> e-Governance activities for providing state-of-the-art end-to-end solutions in the State are rapidly increasing. In this endeavor, NIC MP is actively supporting us. Some of the projects are really worthy to be emulated in the country. We are extensively using VC services of NIC in monitoring various projects/ schemes of the government.
>
> **S.R. MOHANTY**
> **Chief Secretary**
> **Government of Madhya Pradesh**

Scholarship Schemes of 9 Departments have been implemented.

- **Social Security Portal:** This web-based system facilitates 11 pension schemes from the same platform. Providing a proactive approach for beneficiary identification, it helps one click pension disbursal directly from State to provide benefit of auto switch, Apki Pension Apke Dwara, NFBS and Vivah Sahayata to the beneficiaries.

- **Integrated e-Payment Platform:** An end-to-end e-payment system to facilitate automation of various processes involved in the utilization of Nirashrit Nidhi, using single nodal bank account. It facilitates rule-based e-payment of amounts and ensures transparent and effective utilization of funds.

- **Nirashrit Nidhi Management System:** It is a web-based solution for e-Payment & Management System for Social Justice and PwD Welfare, GoMP.

- **NGO Management System:** It is a web-based management system for Social Justice and PwD Welfare.

- **Special Project for Assistance, Rehabilitation & Strengthening of Handicapped (SPARSH):** This web-based solution helps encourage persons with disabilities to pursue education and enables them to have better access to education, thereby empowering them to lead an independent life.

Labor Sector

- **Jankalyan Portal:** It is intended to help extend benefits of schemes to the registered workers and their family members of 25 identified unorganized sectors. This solution is meant for survey, registration & sanction, and e-Payment of benefits of various schemes to registered workers in a transparent and hassle-free manner. The system has been seamlessly integrated with IT applications of NHM, Ayushman Bharat Mission, three power distributing companies, and scholarship portal.

"The portal has resulted into a significant improvement in the ease of doing business, savings to the government and convenience to the citizens", says Shri Sanjay Dubey, Principal Secretary, Department of Labour.

Food Sector

- **MP e-Uparjan:** It is an end-to-end workflow based system that allows operations from farmers' registration to procurement of grains from them to transportation

to warehouses to payment to various stakeholders. This system has resulted into the simplification of procedures and transparency at all levels.

Cooperative Sector

- **eCooperatives:** It is a suite of sub-systems developed as per the M.P. Cooperative Societies Act 1960. Various sub-systems provide for Society Registration, which facilitates Automatic Society Auditor Allotment, CA Empanelment, Housing Society Complaint Monitoring, SMS Management, HR Management, RTI Application Tracking & Madhya Pradesh Cooperative Judicial Court Case Management System (MP-CJCMS) and Crop Loan Waiver Scheme - Complaint Monitoring. The Mobile Apps, MP Kadaknath and MP-CJCMS are also in use.

Internal Security

- **eProsecution:** The Department of Public Prosecution pleads matters/ cases on behalf of the State Government in various criminal courts spread across the State. The prosecution officers use the e-prosecution App to register details of their activities, functions, cases, court proceedings etc. It helps in the evaluation of the performance of prosecutors, thereby increasing efficiency of the overall system.

- **ePrison:** It is an online system that covers the entire lifecycle of an inmate inside the prison. It is implemented in 51 Jails of the State.

- Immigration, Visa, Foreigner's Registration and Tracking (IVFRT), eForensic and National Database of Arms License – Arms License Issuance System (NDAL-ALIS) projects are also implemented.

Women and Child Development

- **National Tracking System for Missing & Vulnerable Children (TrackChild 2.0):** It is implemented to enable the identification of missing children.
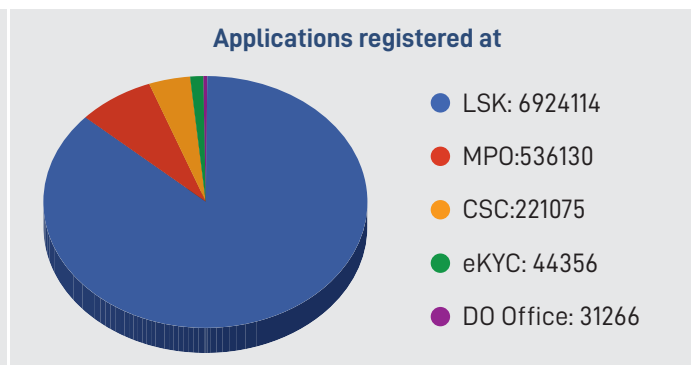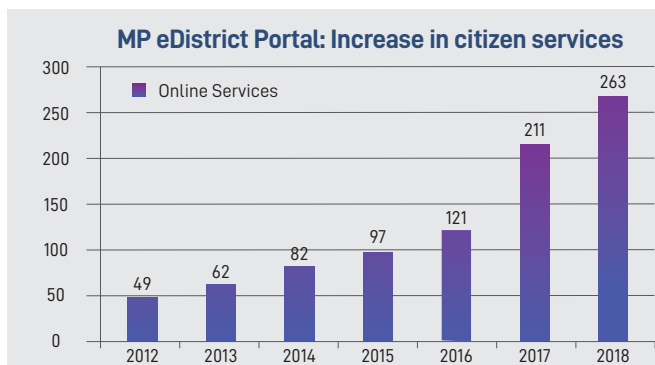
Public Services

- **eDistrict:** MP eDistrict portal ensures electronic service delivery of identified 263 high volume citizen centric services of 29 Departments through 412 Lok Seva Kendras, 42,000+ CSCs and 39,000+ MPO kiosks. Citizens can also apply online directly through the portal and Android and iOS applications on Lokseva for select services.

MP eDistrict Portal: Increase in citizen services

Online Services

Year	Value
2012	49
2013	62
2014	82
2015	97
2016	121
2017	211
2018	263

Applications registered at

- LSK: 6924114
- MPO: 536130
- CSC: 221075
- eKYC: 44356
- DO Office: 31266

eDistrict statistics

Geological Information Systems (GIS)

These are being considered as a major tool in supporting decision-making in various sectors in the State. Some of the prominent GIS applications include eMarg for maintenance of Rural Roads under PMGSY, GeoReach for monitoring the workflow of rural road connectivity project and Geo T&CP for exploring GIS based Master Plan of towns amongst others.

A number of Office Automation projects catering to the needs of various departments are in active use and are making a positive impact on the working of the State Government.

- **eOffice:** The eOffice Product Suite of NIC aims to achieve a simplified, responsive, effective, unified and transparent way of working in all the government offices. Its implementation in the State is in active progress. eOffice is also included in the curriculum of courses by the State Academy of Administration.

- **SPARROW:** This application facilitates the online submissions and tracking of Performance Appraisal Reports (PARs) of the officers of Central Services and filing of their Property Returns every year. The application is operationalized for officers of IAS, IPS, IFS cadres of MP, besides State SAS and SPS Cadre.

- **Biometric Attendance System:** The facility has been extended to various State Government and Central Government Departments.

- **eProcurement:** It covers the complete process of procurement right from the creation of tenders to award of contract, and it has been implemented in all the GoMP Departments, Organizations and PSUs.

- **DARPAN:** It is a Dashboard for Analytical Review of Projects Across Nation that transforms complex government data into compelling visuals. It has been implemented in various districts.

Other Key Initiatives in the State

NIC Cells are established at important locations like Rajbhavan, Vidhan Sabha, CM Office and State Secretariat for automation and implementation of various systems. NIC District Centres are providing e-Governance support to the District Authorities and running various Mission Mode Projects as well as State level and local level projects, apart from imparting training and maintaining operational services such as e-mail, network and video conference.

Awards and Accolades

- National eGovernance Awards in Innovations for Education Portal, iGeo-Approach

- State Gold Icon Award for Innovations in e-Governance initiative for Panch Parmeshwar

- State Award for Innovations and Sustainability in e-Governance initiative for e-Pravesh

- Gems of Digital India 2018 Award for Excellence in e-Governance, e-District

- Skoch Award Gold & Skoch Award of Merit in Gold Category for Madhya Pradesh Cooperative Judicial Court Case Management System (MP-CJCMS), Kalam Award for Innovation in eProsecution

Summary

With its dedicated manpower at District Informatics Centres, State Centre and other Sub centres, NIC Madhya Pradesh stands committed to leave a lasting impact in e-Governance arena in the State. ■

Geo T&CP web application

GeoT&CP
Directorate of Town & Country Planning, Govt. of Madhya Pradesh

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District Koraput, Odisha

Speeding up e-Governance through ICT-enabled initiatives

Edited by
DIBAKAR RAY

NIC Koraput has been playing a vital role in making the District a leading one in terms of providing ICT-enabled government services to citizens. DARPAN is a major project implemented for District Magistrate to monitor the execution of schemes on real time basis, while Geographical Information System is another important project developed for the mapping of different facilities available in the District.

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Located at the backdrop of green valley's immaculate freshness, Koraput District was established on 1st April 1936. Decorated by forests, waterfalls, terraced valleys and darting springs, the District makes for a perfect tourist destination for nature lovers. It comprises of 2 subdivisions (Jeypore and Koraput), 14 tahasils, 14 blocks and 2045 revenue villages.

Apart from a flourishing tourism, the District has also witnessed advancement in terms of technology. Koraput NIC has been dedicatedly engaged in implementing various Central and State e-Governance Applications. The District Centre has NICNET infrastructure with 100 mbps leased line connectivity, and it provides network connectivity to District Administration, District Session & other Courts, Regional Transport Office, Central University Koraput, SLNMCH Medical College, Aadhaar Enrolment Centre, Food Corporation of India etc.

ICT Initiatives in the District

WebGIS for Koraput

A multilayer GIS based website has been developed for Koraput District in which all the infrastructural facilities, administrative units, natural resource layers, communication facilities and developmental attributes and facilities are mapped.

District Portal

Redesigned using Secure, Scalable and Sugamya Website as a Service (S3WaaS), Koraput District portal (*https://koraput.nic.in*) is bilingual (English & Odia) and is in compliance with the Guidelines for Indian Government Websites (GIGW). The District website is a single point information source to access important information about the District, and it provides latest information related to the ongoing government programmes, circulars, proceedings, general orders, recruitment and tender notices, district gazettes etc. It also provides links to social media interface of the District Administration on Facebook, Twitter etc.

DM Dashboard

The Dashboard for Analytical Review of Projects Across Nation (DARPAN) has been provided for the District Magistrate. By transforming complex government data into meaningful visuals, the DM

> The NIC District Unit has always played a pivotal role in channelizing the powers of e-Governance to masses in this remote and aspirational District. The role of ICT in ensuring transparent and inclusive governance cannot be stressed upon more in this technology driven era. NIC has always been instrumental in developing, hosting and securing government websites by deploying state-of-the-art technology and infrastructure. NIC District Centre has been working as an integral part of the District Administration in capacity building as well as in promoting and implementing various ICT enabled initiatives & projects in the District. I sincerely appreciate the efforts put in by the NIC District Unit officials.
>
> **SUDARSHAN CHAKRAVARTHY, IAS**
> **Collector & District Magistrate**
> **Koraput**

GIS based website of Koraput District

Koraput District portal

DM Dashboard

Land Records Management System application
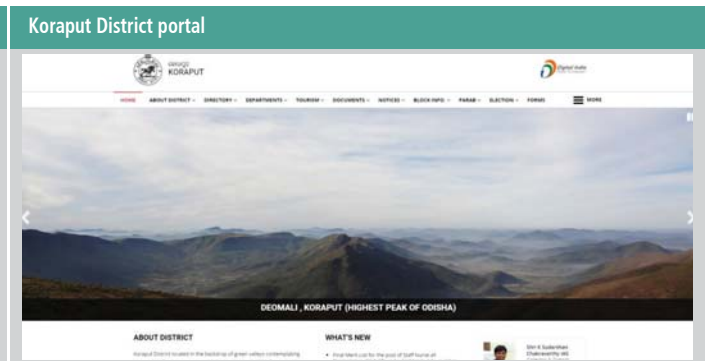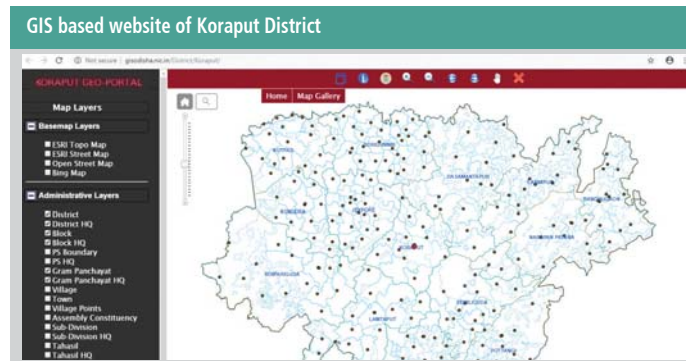
Dashboard serves as a powerful tool for dynamic project monitoring for the District Administration. It enhances analytical capabilities by providing a centralized easy-to-access platform, which consolidates data from multiple data sources.

Inaugurating the Dashboard, Shri K. Sudarshan Chakravarthy, IAS, Collector and District Magistrate, Koraput, said, "Timely and effective implementation of schemes/ projects is critical to the success of government programmes. Digital technology has proved to be extremely useful in planning, implementation and monitoring of government programmes."

Land Records Management System (LRMS)

The Land Records Management System is a web-enabled application software, developed to maintain up-to-date Record of Rights. It is a transaction based application that interacts with the e-Registration application through web services. The system helps the Mutation Officer (Tehsildar/ Additional Tehsildar), posted at Tehsil, to initiate a mutation case instantly whenever there is a transaction at Registration Office. Using LRMS, 1089938 Record of Rights have been generated and 865386 plot maps have been digitally corrected in Bhunaksha.

eProcurement

eProcurement has been implemented at all the State Government organizations, NALCO at Damanjodi, and Central Cattle Breeding Farm at Sunabeda.

ICT Support for Simultaneous Parliamentary and Assembly Election 2019

For the smooth conduct of General Election for the Parliament and the Legislative Assembly, NIC Koraput provided ICT support for randomization of polling personnel, booth allocation to polling party, EVM randomization, establishment of counting centre, and transmission

Smt. Pratibha Singh, DDG & SIO, Odisha, Dr. Ashok Kumar Hota, STD & ASIO, Smt. Sailabala Prusty, TD & DIO, in a meeting with Shri D.K. Mohanty, Executive Director, NALCO, Damanjodi, on eProcurement activities at the organization

Hon'ble Chief Justice of India laying foundation stone of DLSA Complex through video conference from State Legal Services Authority, Cuttack, on 9th September 2018

eNijukti, Rainfall Monitoring System, Messaging Services and National Knowledge Network.

Important Events

District Legal Services Authority

NIC Koraput provided support to the District Legal Services Authority (DLSA) on the occasion of foundation stone laying of DLSA Complex by Hon'ble Shri Justice Deepak Mishra, the Chief Justice of India, in September 2018.

Video Conferencing (VC)

Outdoor video conferences arranged for the Ministry of Petroleum and Gas; the Hon'ble Prime Minister of India interacting with students of Government College, Koraput

NIC VC Studio facilitates different beneficiaries and organizations to attend the Hon'ble Prime Minister's Video Conferences.

Awards and Accolades

• Award to NIC Koraput for exemplary performance on digital payments initiatives

• Digital India Award 2018 - Web Ratna Silver for Koraput District Website

Summary

NIC Koraput is committed to provide ICT support to the District Administration, State Government Departments, Central Government and Public Sector Units in the District. Stable internet connectivity up to gram panchayat and village level is required for implementation of e-Governance Applications for all citizens. ■

Smt. Sailabala Prusty, DIO, Koraput, receiving Digital India Award from Shri Ravi Shankar Prasad, Hon'ble Union Minister for Law & Justice, Communications and Electronics & Information Technology

of results through Suvidha and EMS applications.

ERONet

ERONet is a system developed for electoral rolls management. It has been implemented in the District for the addition, deletion, and updation of voters' list.

Agmarknet

Agmarknet portal has been implemented in the District to connect agricultural markets and state marketing boards.

eNAM

National Agriculture Market (eNAM) has been implemented at Kundili market of Koraput District. It removes the information asymmetry between buyers and sellers, thereby promoting real time price discovery based on actual demand and supply.

Other projects implemented in the District are Vahan & Sarathi, National Animal Disease Reporting System, Immigration, Visa and Foreigner's Registration & Tracking, National Social Assistance Programme, ePrison, Arms License Issuance System, Smart Performance Appraisal Report Recording Online Window, eCourts, eCounselling, eAbhijog, Automation of Small Savings Activities, College Accounting Procedure Automation, Online Registration of Entrepreneurship Memorandum I & Entrepreneurship Memorandum II of Entrepreneurs for Micro, Small or Medium Enterprises, Geographical Information System for Left Wing Extremism Districts, Local Government Directory, Jeevan Pramaan,

Smt. Sailabala Prusty receiving the award for initiatives on digital payments from Shri Ravi Shankar Prasad

District Kurukshetra, Haryana

Promoting the vision of 'Digital India' and raising the bar for e-Governance

Edited by
SARBJEET SINGH

Marking an active contribution to the aim of Digital India, NIC Kurukshetra District Centre has devised and implemented technological solutions to help enhance e-Governance, thereby addressing social needs of citizens. Community engagement has also been an area of constant focus for the District so as to proceed towards a socially acceptable and economically feasible pathway, leading to a better India.

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Kurukshetra District was formed in the year 1973 with its headquarters at Thanesar. A place of great historical and religious significance, Kurukshetra has been described in the first verse of Shrimad Bhagvad Gita as 'Dharmakshetre Kurukshetre'. This is the land on which the battle of Mahabharata was fought and Lord Krishna inspired Arjuna for action through his sermon on the philosophy of karma, famously known as Shrimadbhagwad Gitopdesh, at Jyotisar. According to the Hindu mythology, Kurukshetra is spread over 48 kos, which includes many places for pilgrims, temples, and sacred ponds. Named after the King Kuru, Kurukshetra is popular for beautiful spots such as historical sites, museums and religious places.

The District has undergone technological advancement and is rapidly progressing with new services being introduced by the authorities. NIC Kurukshetra has been leading the implementation of ICT projects in the District.

ICT Initiatives in the District

Digital certification of government schools

Kurukshetra District Administration has started recognizing government schools through digital certificates. In this pursuit, a number of ICT initiatives for schools, taken by NIC Kurukshetra, have been brought to a single platform. In order to ensure that the schools receive this certification, they need to ensure the adoption of all the following initiatives in their schools.

Functioning television sets in schools

In 2007, over 700 schools in Kurukshetra District received a television set, a dish antenna and a set top box, each through a central government project, to connect schools with the EduSat satellite launched dissemination of information to schools. Soon enough, it was found that these television sets fell short of people's aspirations. NIC Kurukshetra upgraded the sets by connecting them with a two-way interactive set top boxes. The presence of external input feature on these set top boxes ensured that the contents could be locally created and

" NIC District Centre, Kurukshetra, under the able leadership of Shri Vinod Singla, District Informatics Officer, has contributed significantly in improving the citizen service delivery system. IT initiatives of the District have always been at the forefront in providing facilities to its people. The District Website provides all the relevant and important information about the schemes of the Government as well as its significance as the land of Gita and Shri Krishna. The Website has been awarded the Digital India Platinum Web Ratna Award for providing information to users/ citizens in an easy and accessible manner. The whole NIC Kurukshetra team deserves appreciation for this memorable achievement. The team of NIC Kurukshetra remains a frontrunner in ideating as well as implementing the IT initiatives in the District.

Dr. SATYAVIR SINGH PHULIA, IAS
Deputy Commissioner,
Kurukshetra "

Saksham Kaksha Mobile Application

English, Hindi, Science, Social Sciences, Geography and Languages from I to XII standards. Questions have been mapped to the textbook chapters to ensure alignment between the school syllabus and resources. The significance and utility of the Application can be judged by the fact that within a month of its launch, over 20,000 teachers as well as parents from the entire State have started using it on a daily basis. Government officers and teachers in other Districts consider it as a sound repository of resources. The App also has a mechanism to take feedback from users in order to improve its user centricity.

disseminated using simple and easy-to-use pen drives. Over 500 government schools in the District have functional television sets with ready-to-use content downloaded on them using a pen drive.

Android Application called 'Saksham Kaksha'

With the advent of smartphones and internet revolution in India, technology has become a powerful lever to bridge the gap in information dissemination. The high smartphone penetration in Haryana can be utilized at the classroom level to equip teachers and educators with appropriate tools. Recognizing this need, NIC Kurukshetra has pioneered and rolled out an Application called 'Saksham Kaksha'.

The Android Application intends to involve parents and community in the academic development of their wards and help in the improvement of resources available to teachers inside the classroom. The Application contains over 30,000 multiple choice questions based on the syllabus of different subjects such as

### eSamarth SMS Application for teachers

NIC Kurukshetra has devised a simple messaging Application for teachers so that they can use the platform to connect with their students' parents on a daily basis regarding their wards' attendance, performance in exams etc. Currently, over 100 schools in Kurukshetra are using this platform.

Two-way interactive video conferencing facility in schools

More than 50 schools in Kurukshetra have been enabled to connect with a two-way interactive video conferencing facility using a third party Android Application called 'VidyoMobile'. A link, which acts as a bridge, gets shared with the nodal teachers of these schools using which, they connect with the video conferencing bridge. Then the mobile devices are connected to the EduSat television sets using an HDMI cable to mirror the phone screen on to the television screen.

Advantages of the Initiatives

● Using digital technology to increase community engagement with government schools

● Edu-tech interventions ensured transformations in teaching-learning processes, which are carried out in government schools.

● All these efforts have the combined effect of changing the cultural norms and expectations and hence, the perception of government schools amongst the wider public.
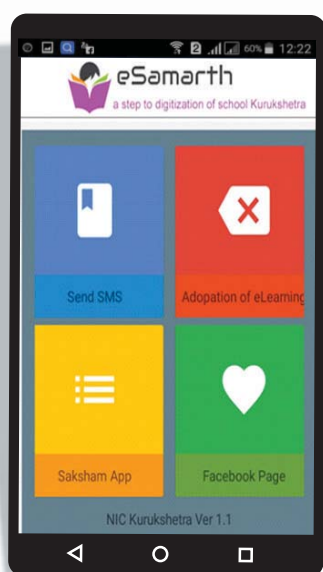
eSamarth Mobile Application

Video conferencing in progress at a school

Deputy Commissioner, Kurukshetra, along with NIC Officers, receiving Digital India Award from the Hon'ble Minister for Law & Justice, Communications and E&IT

Other Key Initiatives in the District

E-challaning and Wi-Fi hotspots in the city

Moving towards digital connectivity and surveillance, Kurukshetra Administration has installed 135 cameras at 15 major roundabouts in the city. NIC has covered the whole city with HD quality CCTV cameras. The live streaming is monitored in the control centre setup at mini secretariat by NIC, with the help of District Police. In addition, 15 selected roundabouts offer free Wi-Fi internet access to residents as well as tourists.

Cycle chalao, Paryavaran bachao

To decrease pollution levels and save the environment, District Administration, with support of NIC Kurukshetra, has initiated a programme to provide cycle services to citizens. The applicants are provided with an RFID card post registration. Cardholders can swipe the card on machine at any of the cycle stands across the city and collect bicycles for their use.

Encyclopedia of Kurukshetra

A year-long District based quiz competition was started from 1st January 2019. A multiple choice question related to the District's culture, history, happenings etc., is displayed on the District Administration's website on a daily basis. At the end of the year, those citizens who would top the charts for correct responses would be recognized with an 'Encyclopedia of Kurukshetra' certificate. This initiative is intended to engage the community with the District Administration and its web portal.

Assessment Visit for Antyodaya Saral Project

A team made a visit to the Saral Kendra, Thanesar, for the purpose of award to assess the operationalization of Saral Kendras under the Antyodaya Saral Project, a flagship project of the Government of Haryana. The team assessed the implementation of Antyodaya Saral project in the District. Kurukshetra was one of the two Districts visited by the team, along with Panchkula. The team wrote to the then Additional Principal Secretary to the Hon'ble Chief Minister of Haryana that they were "amazed at some of the initiatives taken at the local level at Kurukshetra by NIC team, along with Kendra officials". The project was conferred e-Governance Award by CSI-Nihilent, subsequent to the visit.

Awards and Accolades

● Platinum Web Ratna Digital India Award for redesigning and customizing of District Administration website on S3WaaS Platform. Dr. S.S. Phulia, Deputy Commissioner of Kurukshetra, along with Shri Deepak Bansal, State Informatics Officer, Haryana and Shri Vinod Singla, District Informatics Officer, Kurukshetra, received the award from Shri Ravi Shankar Prasad, Hon'ble Minister for Law & Justice, Communications and Electronics & Information Technology, during Digital India Awards event held in New Delhi on 22nd February 2019.

● Skoch Golden Award for EduSat E-learning classes project during a ceremony held at Constitution Club in New Delhi in 2017.

Way Forward

The goal is to reach all the government schools in the District so that Kurukshetra becomes a model District and sets an example for the rest of the Districts in the field of technology in education. NIC Kurukshetra is dedicated to make sincere efforts towards supporting the District Administration in technological matters. ■

Dashboard displaying data of bicycles issued
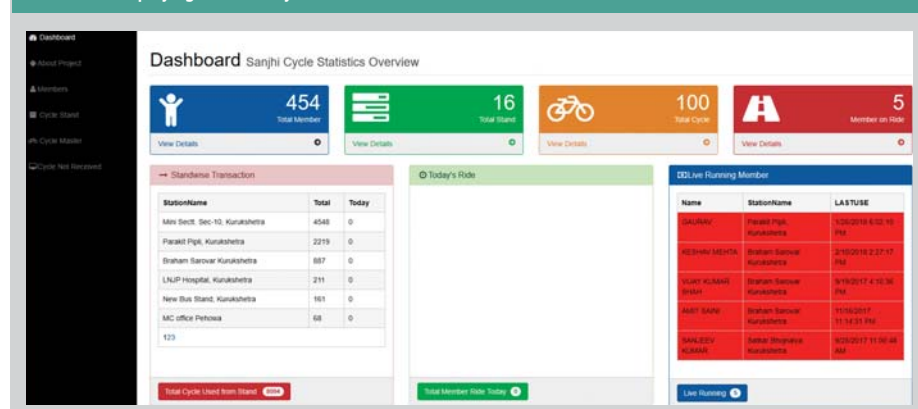
For further information, please contact:

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HARYANA - 136118

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District Vellore, Tamil Nadu

On a high ride to leverage e-Governance through ICT initiatives

Edited by
REUBAN K.

Vellore is one of the thirty two Districts of the enchanting Tamil Nadu State. NIC Vellore was established here to provide ICT support to District Administration and other Departments to facilitate efficient e-Governance in this large area bound District. Equipped with state-of-the-art IT infrastructure, NIC Vellore boasts of a dedicated 1 Gbps line with backup line, video conference facility etc. Furthermore, the centre is the hub of IT consultation and e-Governance activities in the District.

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Vellore District is located in northern part of Tamil Nadu, and it shares border with Andhra Pradesh. Covering an area of 5920.18 sq. km, the District is comprised of 13 taluks, and this makes it one of the biggest Districts of the state. Vellore had the privilege of being the seat of the Pallava, Chola, Nayak, Maratha, Arcot Nawabs and Bijapur Sultan Kingdoms. Vellore Fort was described as the best and strongest fortress in the Carnatic War in the 17th Century. It has witnessed the Sepoy mutiny of 1806. Apart from being a desired travel destination, Vellore is also popular for leather products, Arcot cuisine and Carnatic Nawabs era handicrafts like cane furniture.

NIC Vellore was established in 1989 to provide ICT infrastructure and services to the District Administration and other government organizations situated here. Since its inception, the organization has been immensely contributing through advanced ICT initiatives in the District, thereby enabling enhanced e-Governance.

ICT Initiatives in the District

District web portal (vellore.nic.in)

The District Website of Vellore, maintained by Vellore District Administration, provides information about facts, history, administration, subordinated departments and tourism to public. Rules, guidelines, information on schemes and programmes are updated regularly in order to ensure transparency and help citizens avail benefits by staying familiar with the District Administration and the government. To promote tourism, details of protected monuments, maintained by the Archaeological Survey of India and the Department of Archeology, Tamil Nadu Government, are given on the website, along with a photo gallery.

The newly improved bilingual (English and Tamil) website, based on S3WaaS (Secure, Scalable and Sugamya Website as A Service framework), provides enhanced user-friendly functionalities and interfaces, in compliance with the Guidelines for Indian Government Websites (GIGW) and robust security standards.

National Knowledge Network (NKN)

A high-speed backbone connectivity system enabling knowledge and information

> To provide transparent and quick services through e-Governance is highly essential for District Administration. Owing to a large area, the District Administration is engaged in providing best and cost-effective services to people at their nearby locations to enable quick access, using ICT technologies. NIC Vellore plays a significant role in providing e-Governance services, along with the District Administration. NIC Vellore is supporting in many ways to achieve the above goal by extending services like software solutions, citizen-centric services, ICT infrastructure, video conferencing, and consultation to Vellore District Administration.

S.A. RAMAN, IAS
District Collector,
Vellore District

District Website of Vellore

sharing among higher education institutes, NKN has been implemented at four institutions in Vellore. They are connected through 1 Gbps NKN connectivity.

Video Conferencing

NIC Vellore has been providing communication services through video conference facility to stakeholders such as District Administration, various departments and public, thereby leading to an effective e-Governance. National and state-wide review meetings, trainings and Central Information Commission hearings are facilitated through the video conference studio of NIC Vellore.

Election related activities

In the recent General Elections to Lok Sabha and By-elections to Assembly Constituencies, the District Informatics Officer (DIO) of NIC Vellore was appointed as the Nodal Officer for ICT Applications, Communication Plan, Poll Monitoring System and Member for District Media Certifying Monitoring Committee by the District Election Officer. Various ICT applications were introduced by the Election Commission of India and Chief Electoral Officer, Tamil Nadu, for pre-poll and poll day activities implemented in the District at Returning Officers (RO) and Assistant Returning Officers (ARO) levels. Various activities like training, troubleshooting and report generations were handled by NIC Vellore for smooth conduct of elections. A continuous monitoring of social media including Facebook, Twitter and Instagram was carried out to find out paid news and advertisements without permission from Media Certifying and Monitoring Committee (MCMC).

TamilNILAM (Tamil Nadu Information System on Land Administration and Management)

This web-based application is implemented to modernize the management of Land Records, minimize scope of land/property disputes and enhance transparency in the Land Records Maintenance System. The system provides citizens with a facility to file application for Patta Transfer/ Sub-division, along with requisite backend processing. Both the rural and urban TAMILNILAM Software have been implemented in Vellore District. Currently, all the town and rural land records are made available online.

Old Age Pension Scheme (OAP)

A State Government back office software has been provided for social security schemes fund management and the processing of schedule preparation. Major social security schemes of the State and National Governments like Indira Gandhi National Old Age Pension Scheme (IGNOAPS), Indira Gandhi National Widow Pension Scheme (IGN-WPS), Indira Gandhi National Disability Pension Scheme (IGNDPS), Destitute Widow Pension Scheme (DWPS), Destitute Differently Abled Pension Scheme (DDAPS) etc., are covered under this web-based application.

Other Key Initiatives in the District

Chief Minister's Uzhavar Padhukappu Thittam (CMUPT)

This application maintains eligible beneficiary farmers' database with various user level access for monitoring the fund and disbursement of each installment of the scheme.

Grievance Day Petition (GDP)/ Petition Processing Portal

The application facilitates the public to submit petitions of their grievances as well as to view the status of petitions at Collectorate Counters, Common Service Centres and online. The petitions are

Visit of Shri Ravi Shankar Prasad, Hon'ble Union Minister for Law & Justice, Communications and Electronics & Information Technology, to Vellore District

Entering public grievance details in Grievance Day Portal

Gold Award being received for Vellore District during Digital India Awards 2018

processed by the Collectorate and the concerned offices of all the Departments by forwarding the petitions back and forth hierarchically down the line till the action taken by the concerned officer is accepted by the Collectorate. It can be implemented at other levels like State, Taluk, etc., in addition to the Collectorate level and also for any individual department.

Integrated Temple Management System (ITMS)

ITMS portal helps citizens find complete information about temples and avail all the temple services. This application offers facilities like management and dissemination of temple information, online temple services to citizens, management of temple properties (movable and immovable), publishing of temple-wise events/announcements etc.

Other Key Projects Implemented

● Immigration, Visa and Foreigner's Registration & Tracking (IVFRT) project's Foreigner Registration Office level modules for services like Resident Permit, Exit Visa, C-Form, S-Form etc., are implemented at District Police Office, Vellore.

● National Database of Arms Licenses - Arms License Issuance System (NDAL – ALIS) is implemented for arms license issuance and renewal. 100% Unique Identification Numbers were generated for all arms licenses issued in Vellore District.

● Aadhaar Enabled Biometric Attendance System (AEBAS) has been successfully rolled out in the Government of India organizations situated in Vellore. AEBAS is implemented at all the High Schools and Higher Secondary Schools coming under the Department of School Education, Government of Tamil Nadu.

● e-Courts project has been implemented at 50 court halls, available in 11 locations of Vellore District.

Other Important Events

● IT infrastructure setup and support provided for the Hon'ble President of India during his visit to Vellore District in May 2018.

● Shri Ravi Shankar Prasad, Hon'ble Union Minister for Law & Justice, Communications and Electronics & Information Technology, interacted with NIC Officials during his visit to Vellore District in February 2019.

● Shri Narendra Modi, Hon'ble Prime Minister, interacted with the beneficiaries of various schemes through video conferences. Vellore was one of the interactive sites for the Prime Minister Awas Yojana (PMAY) Scheme.

● Programmes of the Hon'ble Prime Minister, Self4Society, MSME Loans, Corporate Initiatives, etc., were webcasted at District level for audience from relevant industries.

Awards and Accolades

● "Gold Award" to Vellore District under "Web Ratna – District" category in Digital India Awards 2018 held in New Delhi

● NIC Officers of Vellore District felicitated for exemplary services by the District Collector during the celebration of Independence Day in 2018

Summary

ICT technologies are essential to provide effective governance and reduce barriers like distance, delay in process, less operational cost etc. The District Administration of Vellore provides cost-effective and simple solutions using technologies and necessary ICT infrastructure. NIC Vellore is the key implementer and solution provider to accomplish the goal of impactful e-Governance in the District. ■

Webcast of the Hon'ble Prime Minister's Programme, Self4Society

Webcast of the Hon'ble Prime Minister's Programme on Micro, Small and Medium Enterprises (MSME) Business Loans in 59 Minutes launch

Integrated Financial Management System (IFMS)

An end-to-end system for Financial Management in the Government of Kerala

Edited by
REUBAN K.

NIC Kerala has developed and implemented various application modules in the IFMS Project. As part of the IFMS project, smooth and successful integration has been achieved with various stakeholder applications such as SPARK (HR Management System) and EMLI (Effective Management of Letter of Credit Issuances).

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ntegrated Financial Management System (IFMS) is one of the prestigious projects of the Government of Kerala, undertaken by the Finance Department and the Treasury Department. The project has been designed in line with the Modernization of Treasury Systems, one of the Mission Mode Projects (MMPs) of the Government of India. IFMS platform envisages end-to-end integration of systems and IT services among various stakeholders such as Finance Department, Treasury Department, Administrative and Line Departments, Accountant General, RBI and Banks.

Objectives

IFMS systems have been integrated with the Accountant General Office for rendering monthly accounts from treasury, sharing e-PPO (Electronic Pension Payment Order), sharing pay slip details of gazetted officers. The State Government systems also share details of GPF and leave details. IFMS Expenditure System has been sharing expenditure, budget and release details to the Public Financial Management System (PFMS) of the Government of India.

Following are the major application modules in the IFMS project:

- e-Treasury - Receipt/ Payment Gateway for Government Departments and Public
- Core Treasury Savings Bank (TSB)
- State Budget Management System

- Draft Plan Budget Management
- Budget Allocation and Monitoring System (BAMS)
- Bill Information and Management System (BiMS)
- Pensioner's Information and Management System (PIMS)
- CoreTIS – Core Treasury Information System
- CRA for e-Stamping and Stamp Management System
- Integrated Accounts Management System (iAMS)
- User Management and Administration System (UMAS).
- E-Ledger – Ledger Management System
- WaMS – Ways and Means System

e-Treasury

e-Treasury is the e-Payment platform for
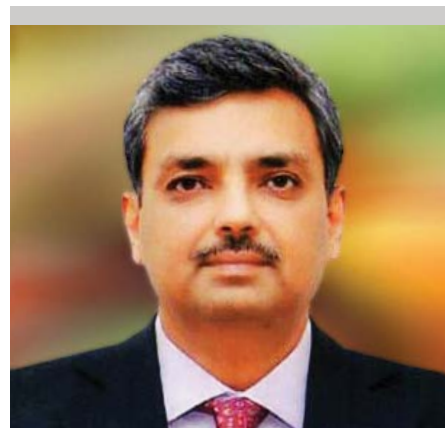
any remittance to the Government of Kerala. Citizens can avail the e-Treasury facility for remittance using the Internet Bank Account for getting any service from the Government Department.

e-Treasury has been integrated with banks. At present, 11 banks are directly integrated. Other 54 banks are integrated with Federal Bank Gateway. Payment modes such as Debit Card, Credit Card and UPI are also available. Besides, cash collection has also been enabled using electronic Point of Sale (ePOS) in e-Treasury platform.

Integration with eKuber

IFMS Payment System has been integrated with eKuber system of RBI. All payments to beneficiaries will be routed to RBI for crediting to any banks in India. Following are the types of payments handled through the integrated system.

● Disbursement of salary of government employees

● Disbursement of pension to pensioners

● Any payment to vendors or contractors

● Payment to beneficiaries in the case of Direct Benefit Transfer (DBT)

● Welfare pensions and other schemes such as scholarship payments as part of DBT

Advantages

● Uniform model for crediting amount to accounts in any banks in India

● Amount credits to accounts in same time in any of the banks in India

● Works on NEFT Cycle - Twelve settlements from 8 am to 7 pm on working days

● Single point of contact for any doubtful transactions, which may be returned due to any issue

● Settlement of accounts with the government on T+0 day (same day) as RBI maintains accounts for the government

Integration with Stakeholders

IFMS covers all the operations in an

Shri Pinarayi Vijayan, Hon'ble Chief Minister, Kerala, speaking during the inauguration of IFMS

electronic mode in the finance sector by integration with various stakeholder systems.

● e-Treasury acts as the government receipts gateway for all types of receipts to the government through Treasury.

● SPARK – HR Management System for Government of Kerala

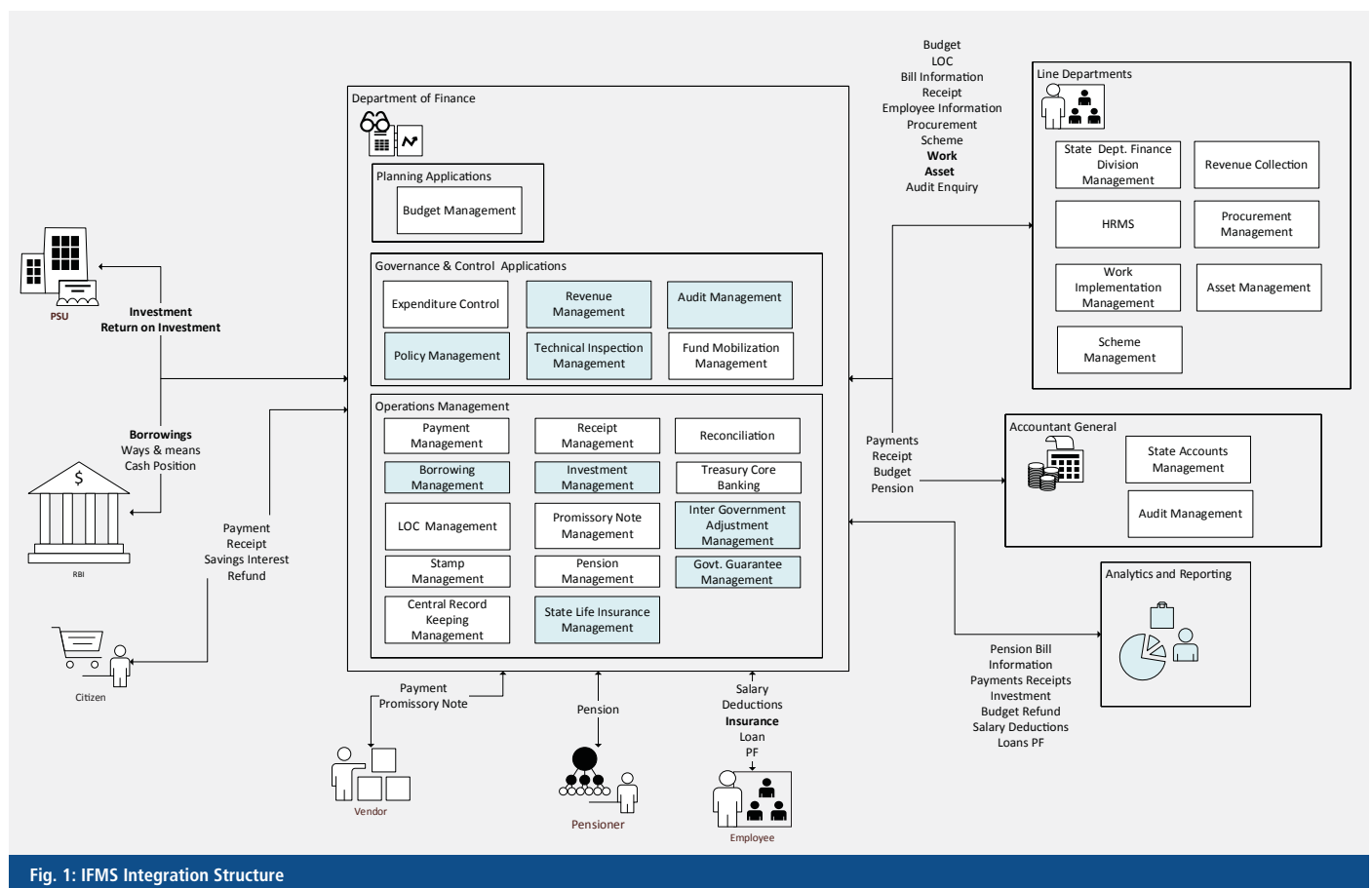● EMLI – System for management of Letter of Credits and bills of contractors

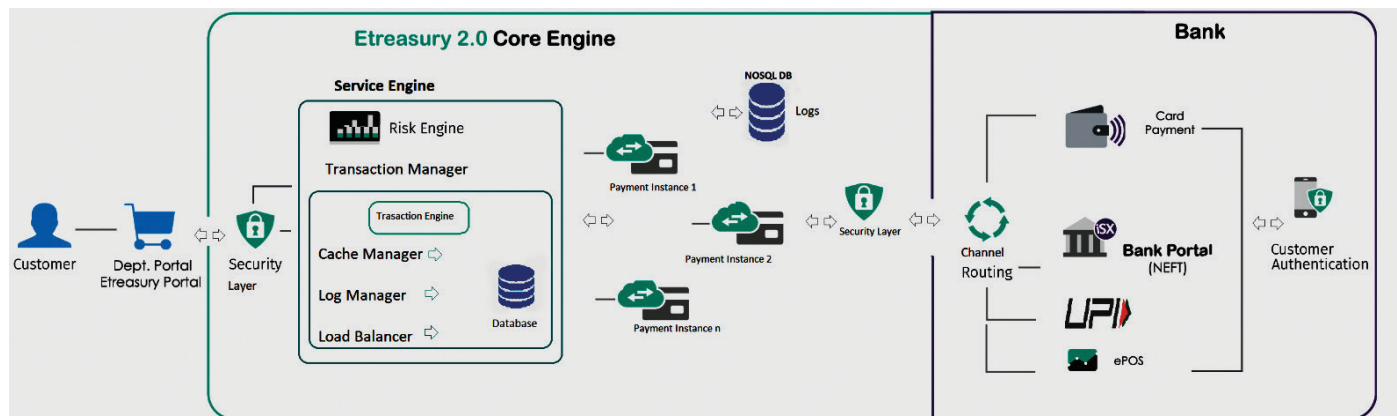**Fig. 1: IFMS Integration Structure**
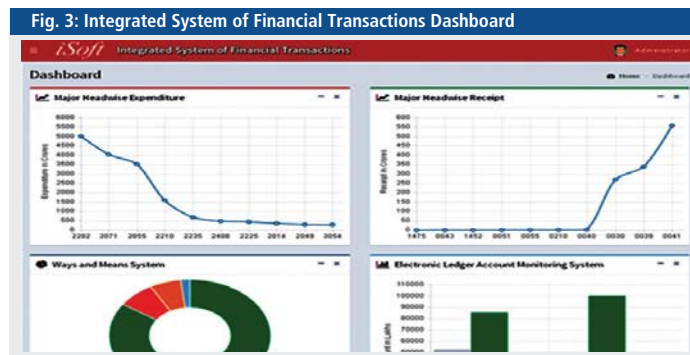
Fig. 2: Process Flow

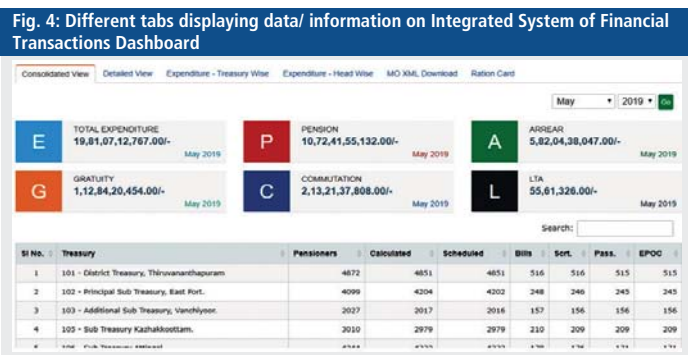Fig. 3: Integrated System of Financial Transactions Dashboard

Fig. 4: Different tabs displaying data/ information on Integrated System of Financial Transactions Dashboard

in the Works Department

- BMS – Budget Management System for capturing estimate for the budget preparation

- Budget – Budget processing system for the preparation of budget for the financial year

- eAnumathi - Administrative sanctions for all Government Departments

- Pension portal

- Gazetted Entitlement Management System (GEMS)

- Audit Management System

- Integration with e-Kuber of RBI

- ePOS machine integration

- 11 Banks directly integrated and 54 banks integrated with Payment Gateway

- Planspace – Expenditure data to Planning Board

- PFMS – Budget and Expenditure data to PFMS

- Electronic data sharing with Life Insurance Corporation (LIC), State Insurance Department (SLI/GIS)

- Saankhya – Software for preparation of bills for Local Self Government Institutions

- Integration of e-Treasury with various service rendering department portals such as Registration, Motor Vehicle, Mining and Geology

- E-Grantz – Scholarship management system for SC & ST

- Government Departments extend eServices by integrating e-Treasury with their respective e-Gov applications

- Online verification and defacement of e-Challan

- Online reconciliation

- e-Scroll from all banks and RBI

- Generalized Integration Model with bank portals and department portals

- Full integration of budget and budget execution cycle

- Effective and efficient monitoring and control of state finances

- Online remittance facility with respect to all taxes and dues to the State Government

- Timely monitoring of government's cash position

- Effective online integration and co-ordination with all stakeholders

- MIS for effective decision-making

Awards and Accolades

- President's Award 2019 for 'Architecture enabled Government Transformation – International Award in Innovation & Excellence' by The Open Group

- Skoch Order of Merit Award 2016

- CSI Valiant Runner-up Award for Best Project in 2015

Way Forward

The realization of Enterprise Architecture (EA) based IFMS for the Government of Kerala is on the roadmap. This would ensure all citizen-centric services with various stakeholders participating in the financial management of the Government of Kerala. All services to citizens, employees and pensioners will be available online from anywhere digitally. ■

eCourts Services

Transforming Judiciary for Effective Justice Delivery

Digital India
Power To Empower

eCourts Apps

NSTEP

ePay

eCourts Website

NJDG

> "The eCourts integrated Mission Mode Project is one of the National e-Governance projects implemented in District and Subordinate Courts of the country. The project facilitates services to litigants, lawyers and Judiciary through universal ICT enablement of District and Subordinate Courts. In line with the Digital India Programme of the Government of India, eCourts aims to deliver efficient, affordable and time-bound citizen-centric services. Citizens can access information about cases from any remote locations. Applications like e-Filing, e-Pay, and National Judicial Data Grid (NJDG) have facilitated real-time availability of judiciary data for monitoring and decision-making.
>
> I am glad that the complete eco-system of the Indian Judiciary, covering the Supreme Court, the High Courts and the District and Subordinate Courts, is brought under a single portal i.e., ecourts.gov.in.
>
> I compliment NIC for this commendable work. e-Committee, constituted by the Supreme Court of India for ICT implementation in High Courts, District and Subordinate Courts is doing a great job towards ensuring a robust and citizen-friendly system for the entire country, and I am confident that the joint cooperation between e-Committee and NIC will ensure that we collectively achieve our common goal of easy and affordable justice for all."

RAVI SHANKAR PRASAD
Hon'ble Union Minister
Law & Justice, Communications and
Electronics & Information Technology

eCourts, a Mission Mode Project of the Government of India, has set an example of successful e-Governance project reaping rich dividends to litigants and citizens of the country. The eCourts project was conceptualized on the basis of the "National Policy and Action Plan for Implementation of Information and Communication Technology (ICT) in the Indian Judiciary – 2005", submitted by e-Committee (Supreme Court of India), with a vision to transform the Indian judiciary by ICT enablement of courts.

The project is implemented at High Courts and all the District and Subordinate Courts of the country. Phase-I of the project was approved in 2010, and it enabled the computerization of 14249 District and Subordinate Courts by 2015. During this phase, ICT infrastructure improvements were completed. ICT infrastructure, covering computer hardware, Local Area Network (LAN), Wide Area Network (WAN), UPS and power backups, was provided to all District and Subordinate Courts. Phase –II of the project, which envisions further enhancements, was commissioned in 2015 for a period of four years. This phase lays great emphasis on service delivery to litigants, lawyers and other stakeholders. It involves the creation of improved ICT infrastructure in courts, video conferencing etc., and ensures optimum automation of judicial and administrative processes.

The project has set up a consolidated nationwide judicial data warehouse with real time updations and availability, which is being used to provide citizen-centric services and inputs for policy making and decision support to the management.

Objectives

- To provide efficient and time-bound citizen-centric service delivery
- To develop, install and implement decision support system in courts
- To automate judicial processes to provide transparency in accessibility of information to its stakeholders
- To enhance judicial productivity both qualitatively and quantitatively
- To make justice delivery system affordable, accessible, cost effective, predictable, reliable and transparent
- To make policy for managing caseloads for effective court management and case load management
- To provide interoperability and compatibility with systems like Interoperable Criminal Justice System
- Installation of video conferencing facility and recording of witness through VC
- To connect all courts in the country to National Judicial Data Grid (NJDG)

Key Implementation Statistics

Districts covered	Court complexes covered	Court establishments covered
627	3,093	6,645

- To provide citizen-centric services through various platforms for service delivery such as web portal, Mobile App, judicial service centre, kiosks, SMS, automated emails etc.

Case Information System (CIS), Application for District Courts and High Courts

India is a multilingual country, with 22 official languages and 12 scripts. The benefits can reach common man only when software tools are made available in people's own language. As eCourts project is implemented at the last mile courts i.e., the District and Taluka Courts, the software is developed in bilingual mode to suit the localization requirements. Services to litigants are available in local language over touch screen kiosks, installed at courts or over query counter available at every court complex. The application is implemented in English and local language scripts like Devanagari, Kannada, Tamil, Gujarati etc.

Apart from the linguistic part, every High Court also has a different set of rules and procedures to administer and manage their subordinate judiciary. Keeping in view the differing procedures from one High Court to another, the software is developed as a single product catering to such diversified requirements of the country. The mechanism has helped achieve central citizen interface in the form of eCourts portal, Mobile App and National Judicial Data Grid.

eCourts project adopts the core-periphery approach of software development. The core part of the software is developed centrally, and flexibility is provided to the respective High Courts to develop the periphery part. The Core CIS application caters to complete functionalities of courts, viz. Case Filing, Case Registration, Case Scrutiny, Case Listing, Court Proceedings, Case Disposal, Process Generation, Lok Adalat etc.

Currently, CIS National Core 3.1 is implemented at District and Subordinate Courts, and CIS National Core 1.0 is implemented at High Courts of India.

Key features of CIS

- Use of Free and Open Source (FOSS) technology
- Unique 16 characters Case Number Record (CNR) for each case in the country
- Dashboard for users and report generation mechanism
- Enabled with National Masters
- Electronic process generation with QR Code
- eFiling and ePay integration
- Integrated Lok Adalat/ Mediation Module
- In-built templates for orders and judgments
- Integrated with ICJS
- Automated SMS and emails on case events
- Operates in bilingual mode

Use of Open Source Technology

The entire project is built on the foundation of open source technology. FOSS, without any licensing/ subscription charges, has been adopted for deploying ICT solutions at courts.

Platforms for Service Delivery

eCourts portal

Showing the status of cases, cause lists, judgments, daily orders etc., eCourts portal *(http://ecourts.gov.in)* is a one-stop solution for all stakeholders such as litigants, advocates, government agencies, police and common citizens. Citizens can locate a case arising from any court across the country using various search criteria available on the website. The website records more than 10 lakh hits daily. It is bilingual, accessible friendly and compliant with Guidelines for Indian Government Websites (GIGW).

➥ Single unified portal across the country
➥ Quick delivery of court services - case status, next hearing date, cause lists, orders and judgments ➥ Easy and

Delivery Channels of Services
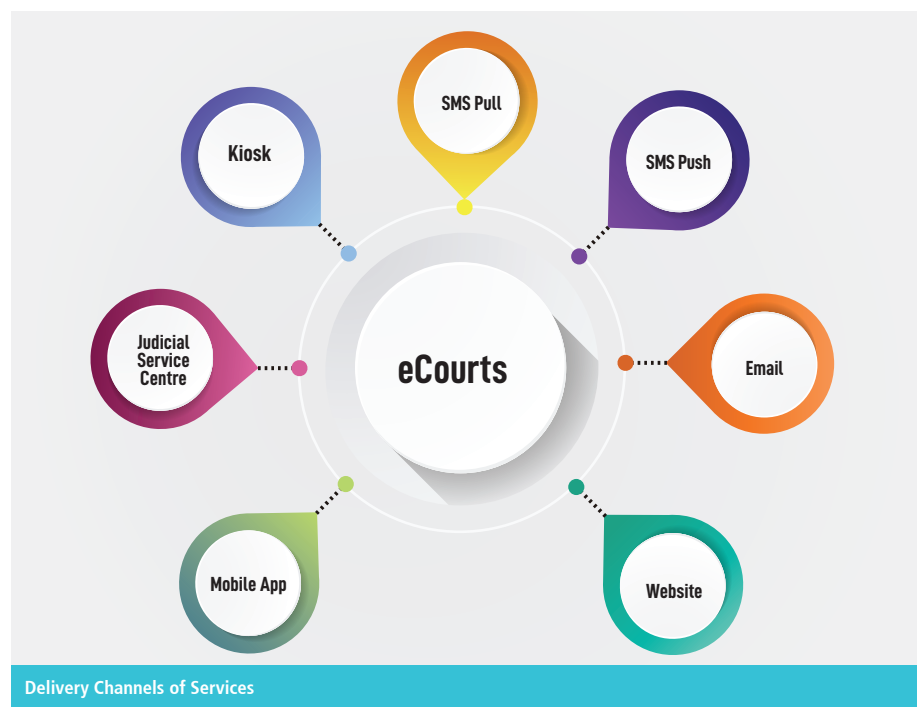
Total cases available on eCourts	Total Orders available on eCourts	Total High Courts covered	Total hits on eCourts per day	eCourts Mobile App downloads
11,19,32,511*	**8,52,83,327***	**21**	**10,00,000***	**25,00,000***

Note: The figures are up to May 2019

efficient access to case information anytime, anywhere

Mobile App

eCourts Services Mobile App provides facility for all stakeholders, particularly advocates and institutions/ organizations (having multiple cases), to create a portfolio of interested cases and track those for future alerts. The Android and iOS App also features a search option to track a case by QR Code. More than 20 lakh downloads of the App have been recorded. A user can create a portfolio of cases by bookmarking important cases. Calendar feature is the latest enhancement provided in the App wherein advocates can view a diary of cases listed in court.

SMS push

SMS push facility is provided to stakeholders like litigants and advocates to get SMS on occurrence of each event in a case like filing, registration, adjournment, scrutiny, listing, transfer of case, disposal, uploading of order etc., on their mobile registered with the court.

SMS pull

SMS pull facility can be used by a stakeholder to send 16 characters CNR number of a case to 97668-99899, and get its current status.

Automated emails

Litigants, advocates and police stations daily get cause lists (pertaining to their cases), events like next dates, transfer of case, disposal, copy of order, copy of judgment etc., in .pdf format on their email ids registered with court.

Touch screen kiosks and service centre

Touch screen kiosks are installed at various court complexes across the country. Litigants and advocates can view case status, cause lists etc., on kiosks. Same information can also be obtained from Judicial Service Centre established at each court complex.

ePayment

Online payment of court fees, fine, penalty and judicial deposits has been initiated online through a portal (*https://pay.ecourts.gov.in*), thereby eliminating the use of stamps, cheque and cash. ePayment portal is also integrated with state specific vendors like SBI ePay, GRAS, eGRAS, JeGRAS, Himkosh etc.

eFiling

The e-Committee of the Supreme Court of India has designed and set up e-Filing system *(https://efiling.ecourts.gov.in/)*, which enables electronic filing of legal papers. Promoting paperless filing, eFiling aims to create time and cost saving efficiencies by adopting technological solution to file cases before the courts. Using the system, cases (both civil and criminal) can be filed before High Courts and District Courts that adopt eFiling system. A user can also pay court fee online through it. eFiling module is integrated with CIS application implemented at District and Subordinate Courts as well as High Courts.

> " The eCourts Project is a collaborative effort of the Supreme Court of India and the Government of India through the National Informatics Centre and is one of the most successful Mission Mode Projects. The Project has enabled information and data availability to every litigant through the National Judicial Data Grid. As a part of continuing benefit to the common people, a transformative concept of a Virtual Court is being pilot tested for deciding traffic offences. Each High Court will nominate a Virtual Judge to preside over a Virtual Court and deal with traffic offences in the State. In fact, a computer system operating 24x7 will assist the Virtual Judge in deciding cases. Fines imposed in the Virtual Court can be paid online and if someone contests the challan, the case will be sent to the regular court for adjudication. It is hoped that by this process, not only will an estimated 20 lakh traffic cases be decided very quickly, but henceforth, there will be no delay in disposal of such cases.
>
> **JUSTICE (Retd.) MADAN B. LOKUR**
> **Chairman, e-Committee**
> **Supreme Court of India** "

National Judicial Data Grid (NJDG)

Growing frustration of common man is about the efficiency of the system. Citizens are curious about the pendency in courts. Tracking of litigation pendency at the level of District Courts is also made open to the general public, researchers, academicians and society at large. The figures of pendency at national level, state level, district level and at individual court level is now open to be accessed by anyone visiting the National

eCourts Services Portal

eCourts Services Mobile App
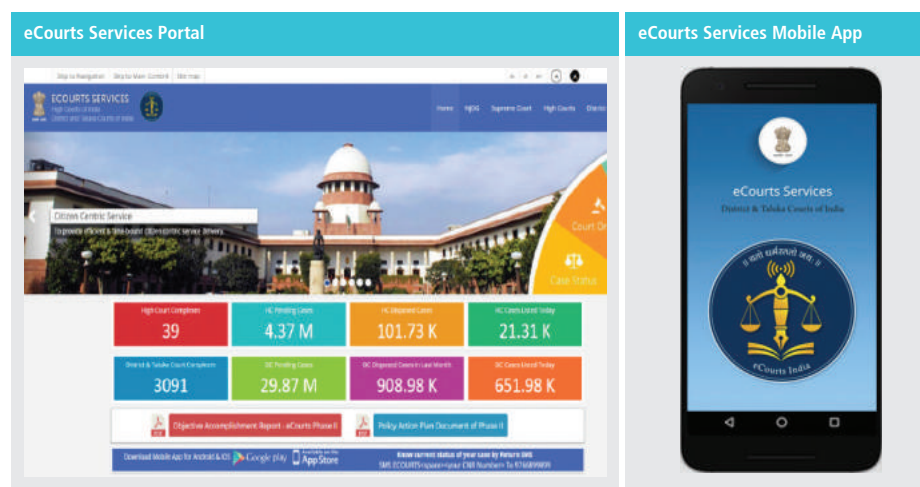
ePay application for online payments

eFiling for online filing of legal papers

Judicial Data Grid portal *(http://njdg.ecourts.gov.in)*.

NJDG also serves as a decision support system to the management authorities like Supreme Court, High Court, and Central and State Government to monitor pendency on varied attributes for effective decision-making. Management authorities can now track pendency of a remotest court of the country.

- Enables transparency in tracking of pendency of cases on attributes like age, case type, stage, delay reason etc.

- Data from all District Courts and High Courts is available on the grid.

- Serves as national judicial data warehouse

- Provides timely inputs for making policy decisions to reduce delay and arrears

National Service and Tracking of Electronic Processes (NSTEP)

National Service and Tracking of Electronic Processes is a mechanism consisting of a centralized process service tracking application and a Mobile App for bailiffs. NSTEP is used for speedy delivery of processes and reducing inordinate delays in process serving. NSTEP Mobile App, provided to bailiffs, helps in real time and transparent tracking of service.

- Once the process is published through CIS software by the respective court, it becomes available at NSTEP in electronic format.

- Through NSTEP web application, published processes are allocated to bailiffs, if service is within the jurisdiction. It may be allocated to the respective court establishment if the service is outside jurisdiction i.e., inter-district or inter-state.

- The allocated processes can be viewed by bailiff on the NSTEP Mobile App.

- Special Personal Digital Assistants (PDAs) are being provided to bailiffs for process service and interconnecting to the courts process service modules. Bailiff, on reaching the location of receiver,

captures GPS location, photo (of the receiver or door lock) signature of receiver and reason for not service. The data captured is instantly communicated to the central NSTEP application.

- Real time updates from remote locations reduce inordinate delays in process service.

- Inter-district or Inter-state service of process is electronic, thereby reducing the time required to send by post.

Integration with Other Systems

UMANG

Unified Mobile Application for New-age Governance (UMANG) is a Mobile App that provides a single platform to citizens to access pan India e-Gov services ranging from Central to Local Government bodies and other citizen-centric services.

eCourts services are now integrated with UMANG App and launched for District and Subordinate courts. All the APIs

National Judicial Data Grid System
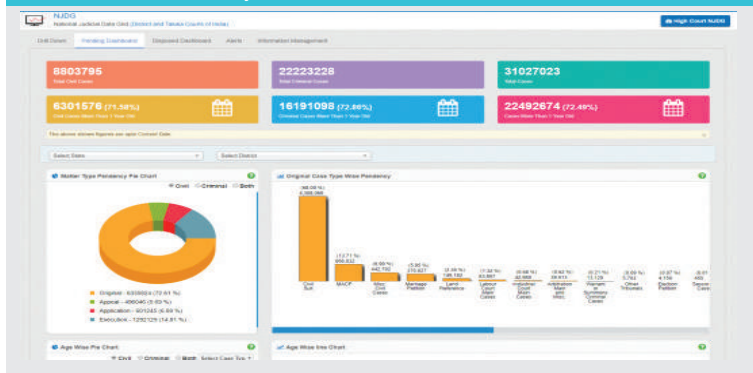
NSTEP Application

required by UMANG were shared by eCourts team. Now case status, orders/ judgments, cause lists etc., are also available through UMANG App to common citizens.

Common Service Centres

Common Service Centres (CSCs) are access points for delivering services to citizens from rural and remote parts of the country. eCourts API is shared with CSCs. Citizens can now get the status of their cases through these centres.

Interoperable Criminal Justice System (ICJS)

Interoperable Criminal Justice System (ICJS) is an ambitious project, aimed at integrating the Crime and Criminals Tracking Network and Systems (CCTNS) project with eCourts and e-Prisons databases, as well as with other pillars of the criminal justice system such as forensics, prosecution and juvenile homes in a phased manner.

eCourts has become interoperable with other pillars of the criminal justice delivery system. In a landmark achievement, a pilot was inaugurated on 15th December 2018 by Hon'ble Shri Justice (Retd.), Madan B. Lokur, Chairman of Interoperable Criminal Justice System (ICJS) and Judge-In-Charge, e-Committee, Supreme Court of India, through video conferencing in Warangal city of Telangana through live electronic exchange of data between courts and police.

Courts can consume live data of FIR and chargesheet from police. If FIR is ready in electronic form in the system of police, ICJS interface will indicate to the court about readiness of FIR data to be consumed. On consumption, court will get FIR number, names of accused, details of offence, time, date, place of occurrence, details of arrest etc. Court will be able to consume this live electronic data from police. In reciprocation, court will send all remand details, bail details, property release etc., to police.

Police will be able to see the update of each FIR and orders passed by the court in remand, bail or release of property.

When the chargesheet is ready in electronic form with police, it will be notified through ICJS interface, and court will consume the chargesheet data. On such consumption, court will get names of the accused and their details, names of victim and their details, names of witnesses and their details, name of investigating officer etc. Apart from these details, acts, sections, date of arrest, on bail or in jail, other details of offence, chargesheet number, FIR number will be sent to court. Court can consume this data and accept the same in Case Information System. In reciprocation, court will send CNR number link to police. The link of CNR number will give all details of the case, parties, advocates, date of registration, first hearing and next hearing date and entire history of the case and business recorded.

Stakeholders

The project is manned and managed by court staff. Judges are using the system to deliver justice speedily. Advocates, litigants, government agencies and citizens are real consumers of the project. The involvement of court staff and judicial officers has ensured effective service delivery to stakeholders.

Court staff and judicial officers

Judicial officers and the court staff members posted at remote District and Taluka Courts are the real service providers and change agents in the project. With challenges ranging from digital literacy to infrastructure requirements such as electricity power and internet connectivity, spectacular results are produced by the judicial fraternity of the country.

Court staff

The ministerial staff members at District and Taluka Courts are trained in using ICT and are efficiently using the system. These staff members are responsible to capture case data and events in the case life cycle. It has considerably reduced the work load of the ministerial staff in generating cause lists, processes,

> eCourts is a Mission Mode Project conceptualized as a part of the National e-Governance Plan (NeGP) of the Government of India for Indian judiciary to provide ICT enablement of courts to facilitate reduction of pending cases, enhancement of judicial productivity, and to make justice delivery system easily accessible, accountable, affordable, transparent, and cost-effective.
>
> The project is being implemented under the strategic guidance of e-Committee of the Supreme Court of India, in collaboration with the technical and infrastructure expert team of National Informatics Centre (NIC). Key objectives of eCourts MMP are: e-Registration of cases, Copies of judgment, Preparation and delivery of decrees, Generation of automated cause list, Generation of court diaries, Availability of case status, and Generation of daily orders.
>
> **S.B. SINGH**
> **Deputy Director General & HoG**
> **eCourts, NIC**

judgment templates, maintaining several registers, generation of statistical returns, certified copies, financial management and several such activities. Business process re-engineering on the part of courts procedures will further increase the benefits of ICT.

Court staff members working as system administrators: Example of capacity building

As it is difficult to get technical manpower to work at remote Districts and Taluka Courts of the country, two ministerial staff members from every District Court are selected to function as

District System Administrators (DSAs). Trained with technical knowledge, they are capable of handling all technical activities at court complexes like Server Management, Network Management etc. These DSAs are now working as IT managers at District Courts of the country.

Judicial officers

Capacity building exercise was undertaken by e-Committee and all judicial officers in the country (more than 14000) are now trained in using ICT. Judicial officers are efficiently managing pendency through the use of ICT. Monitoring of court activities and overview of case proceedings have given more control on the cases. Various alerts provided by the system help judicial officers in better decision-making.

JustIS Mobile App, provided to judicial officers, helps them to monitor pendency and disposal at finger tips. Alerts on undated cases are also provided to them through SMS. Use of digital signatures for signing orders/ judgments/ notices is initiated.

Services to Stakeholders

Litigants/ Citizens

The motto of judiciary is to promote transparency and provide access to information to all the stakeholders in the justice delivery system. The litigants were generally clueless as to why their cases languish for years together. They find it difficult to understand why courts require their presence on several dates without any business being transacted on those dates. The queries ranging from what has happened in the court on a particular date as to when the case is listed next and for what purpose were asked by the litigants to the ministerial staff. It becomes further more difficult a litigant when they are not aware of the judicial case number.

Such issues are now resolved and the queries can now be answered through multiple service delivery channels such as website, Mobile App, SMS, email, kiosk, and query counter. Citizens need not visit court or even enquire the advocate about the case status.

Services like case status, cause list and orders/ judgments from courts in the country are available to citizens on the web portal *(http://services.ecourts.gov. in).* The entire history of a case is also available. Litigants can view the business transacted on the date and check orders/ judgments given by court. They can also check the reason for adjourning the case. Searching of the case even by a litigant's name has ensured ease in searching of case by a layman without having any judicial knowledge.

It has been ensured that the services cater an all-inclusive approach. The eCourts Services portal is also accessible to differently abled persons. Web Content Accessibility Guidelines (WCAG) are followed.

While transparency is provided to citizens at large, privacy concerns of individuals are also addressed. In the disputes of private nature like family matters, or those mandated by law, a facility is available to mask names of litigants, thereby hiding identity of individuals from the public.

Services are also provided by alerting users through SMS or email proactively. Various events of case life cycle are triggered through SMS/ email to litigants. For those who don't have access to website or SMS, touch screen kiosks and query counters are established at local Taluka/ District Courts to help individuals visiting courts find case information.

Mobile App has further enabled litigants to fetch case details on mobile. A case can be saved and refreshed in mobile to update the current status.

Advocates/ Lawyers

Advocate is a link between judiciary and the litigant. Advocates are main consumers of the system. Case information is currently provided to lawyers through web and mobile SMS, email and Mobile App. Copies of judgments and orders are available online. Collective information of all the cases pertaining to a particular advocate and advocate-wise cause list is also

available. Advocates need not maintain case diary physically.

The communication between courts and advocates is one way i.e., from courts to advocates. It has to be both ways. As advocates are becoming more and more tech-savvy, the effective use of ICT will further improve. The inception of new modules like eFiling and submission of eDocuments and eApplications have ensured the communication of advocates to courts in a speedy manner and in digital format with flexibility of submitting documents 24X7 from the comfort of advocates' own office.

Court fee and all other fee payments are now made through digital mode instead of judicial stamps or currency.

Mobile App is serving as a boon to advocates. It has also ensured speedy access to cases by searching on various criteria including advocate bar registration number. Advocates can create portfolio of their own cases for tracking them easily. Facility like calendar has eliminated the use of maintaining diary. Viewing the occupancy in calendar is further assisting advocates to fix case dates. e-Filing facility helps advocates file case without even physically presenting the case in court.

Police/ Government departments/ Financial institutions

Police, government departments and financial institutions are major stakeholders in justice delivery system. More than 50% criminal cases where police/ state is stakeholder are pending in the country. Suit filed by or against government departments or financial institutions forms another major part of pendency. A facility is available to these major stakeholders to track cases through service delivery channels such as website, Mobile App, automated emails, SMS and kiosk. Special facilities are available to police to track cases by selecting respective police station or by entering the FIR. Similarly, government departments can track cases

Participants of eCourts NIC Coordinators Workshop in Pune from 12th to 14th June 2019

by selecting case type, e.g., land ref cases. Financial institutions such as insurance companies can track cases just by selecting MACP Case Type. Further, a facility is available to these stakeholders to search cases using their acts/ sections. All these facilities are available on public service delivery mechanism such as website and Mobile Apps. Respective government departments can track cases remotely, and the management authorities can also track cases of courts or their department scattered across the state at finger tips.

Open APIs are being published for these departments to further develop their own monitoring and compliance mechanism/ software to track and manage their cases. This will help major stakeholders proactively take actions on the courts' directions and comply accordingly.

Workshop for eCourts NIC Coordinators

A workshop for eCourts NIC coordinators was held at NIC Pune from 12th to 14th June 2019 and was attended by all the NIC coordinators working at High Courts. Sessions on new technologies on Cloud Computing, Linux, PostgreSQL, Elasticsearch, Data Centre and Network Management were conducted by subject experts. Participants also discussed about new technologies and their usage in the implementation of eCourts project.

Awards and Accolades

Digital India Award for Best Mobile App 2018

Gems of Digital India Award 2018 (Jury's choice) for Excellence in e-Governance

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PFMS-Pension (e-PPO)

Enabling digitally signed PPO and seamless vouching of post-retirement benefits electronically to pensioners

Developed by NIC Controller General of Accounts, the PFMS- Pension module comprises a provision of either obtaining a retiree's/ pensioner's data electronically from Bhavishya application of the Department of Pensions after the data verification from the Head of Office (via SSIS integration) or capturing the data manually by Pay and Accounts Office.

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PFMS-Pension is a web application developed by NIC Controller General of Accounts (CGA) for the generation of digitally signed Pension Payment Orders (PPOs) and vouching of post-retirement benefits to pensioners through electronic mode, incorporating Central Civil Services Pension Rules.

The application is tightly integrated with Bhavishya application of the Department of Personnel and Training (DoPT) for obtaining validated data from the Head of Office (HoO) via SQL Server Integration Services as well as with Pension Authorization, Retrieval and Accounting System (PARAS) application of Central Pension Accounting Office (CPAO) for obtaining the PPO number via web service and providing digitally signed PPO (e-PPO) to CPAO via SFTP server and payment and other details to Bhavishya.

Major stakeholders in the application are retiree/ beneficiary, HoO, Bhavishya (Department of Pensions), Pay and Accounts Office (PAO) and CPAO.

Objectives

● Automated exchange of data with Bhavishya application of DoPT

● Timely and accurate calculation of pension, with payment of post-retirement benefits and effective monitoring by all the stakeholders

● Generation of digitally signed PPO (e-PPO)

● Automated transmission of e-PPO, along with allied documents to CPAO

● Generation of various payment authorities

● Integration with PFMS-Sanction Module for payments

● Intimation to retiree/ beneficiary via SMS for PPO number and payment of post-retirement benefits.

● Reverse flow of information to respective stakeholders (e-PPO, payments details etc.)

● Manual data entry option for exceptional cases

Technologies Used

● The application is developed in ASP.Net with C# as the scripting language using framework 4.7.1.

● Backend database is SQL server 2017.

● The data from Bhavishya is obtained via SSIS package.

● The PPO number is obtained from PARAS application of CPAO via web service.

● The Digitally Signed Certificate (DSC), e-PPO and allied documents are transmitted to CPAO's SFTP server using Window's services.

Process Flow

Lifecycle of the software starts by obtaining the data of a retiree/ pensioner either electronically from Bhavishya application via SSIS integration or capturing the data manually by PAO Office. The data is made available to PAO office for checking/ verifying at three levels, viz. Dealing Hand, Assistant Accounts Officer and PAO. A user can also view photo, signatures, undertaking and other documents of the retiree/ pensioner.

Calculations performed by both applications, PFMS-Pension and Bhavishya, are displayed to users. After analyzing both calculations, a user can either pass the pension case for next level or simply return data to Bhavishya, along with necessary remarks. After the pension case is passed at all levels, the PPO number is obtained from PARAS application of CPAO via web service, and the e-PPO report, along with its XML content, is generated and digitally signed by PAO. The digitally signed e-PPO, XML file and the allied documents are sent to the SFTP server of CPAO.

Bhavishya-PFMS Pension Case Process Flow

Sanctions of the post-retirement benefits are generated by PAO for making electronic payments to retirees/ pensioners. PPO and payment details are also shared with Bhavishya. Various reports, viz. calculation sheet, pension authority etc., can be generated by the user.

Benefits

- Processing of different PFMS-pension cases flawlessly as there is electronic exchange of data between Bhavishya, PFMS and CPAO

- Fast movement of data as PFMS obtains data from Bhavishya electronically without any manual intervention

- Bringing greater transparency in processing of pension cases

- Electronic disbursement of post-retirement benefits (retirement gratuity/ death gratuity/ commutation/ withheld gratuity) to retiree's/ pensioner's bank account

- Validation of bank details (via PFMS sanction module) to minimize payment failures

- Future retiree/ pensioner is informed regarding the generation of PPO number and DSC of e-PPO via SMS.

Summary

Following types of pension cases are being handled:

- Superannuation Case
- Retiring Pension Case
- Family Pension Case
- Compulsory Retirement Case
- Invalid Pension Case
- Compassionate Pension Case
- Revision of Pension Cases

The following types of cases are proposed to be implemented.

- Extraordinary pension cases

- Family pension cases of new pension scheme employees
- Provision of issue of corrigendum and amendments
- Family pension case with more than one family pension

It is noteworthy that 6346 digitally signed e-PPOs have been generated and transferred to CPAO, and payment authorities of 308 revision cases have been successfully processed. Currently, 421 PAOs are onboarded, and it is proposed to be implemented at 511 PAOs across the country in the current financial year. ■

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e-Nirvachan

An online Polling Personnel Management System for Election Department of Assam

The polling personnel must be preferably drawn from both the State Govt. Departments and the Central Govt. Offices during elections. To fulfil all these criteria, it is difficult to carry out such works by using a traditional methodology, and this necessitates the use of an IT application.

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e-Nirvachan (Assam) is a solution product developed by NIC Assam for the management of election processes. It can be used for any election, be it parliamentary or assembly or any state level (Panchayat/Council) election. Initially, in order to ease the processes of manpower management for an election, this software was developed by NIC Nalbari, Assam, in consultation and guidance with NIC Assam State Unit and Chief Electoral Officer, Assam. The process of development of the application started during early 2014 Parliamentary Election. This Application was widely and successfully used by all the districts and subdivisions of Assam during all the elections held, including Local Body Elections, Panchayat Elections, Autonomous Council Elections and Bodoland Territorial Council Elections.

History

The randomization of polling person using Software Application was partially started in Assam since 2006 Assembly Election. During that period, a standalone Application using Visual Foxpro was developed and used in 3 or 4 districts of Assam. During the Parliamentary Election 2009, another application in ASP and SQL Server was developed and used in most of the districts of Assam as an offline web-based application. During the Assembly Election 2011, one more application with SQL Server and Dot Net Framework was developed and used in some of the districts of Assam.

Since all the above applications need licensed version of SQL Server Database, it was not possible to implement it at the subdivision level. Hence, the need of the hour was to develop an application in Open Source Platform so that districts as well as sub-divisions could implement it without any legal issue. Therefore, a PHP/PostgreSql based application was developed during the Parliamentary Election 2014 and was used successfully by all the districts and subdivisions of Assam. The same application was also used during Assembly Election 2016 and BTC Election 2015 successfully.

Finally, it was decided to make the application a generic and secured web-based application so that it can be used in all types of election including the local body election. The online
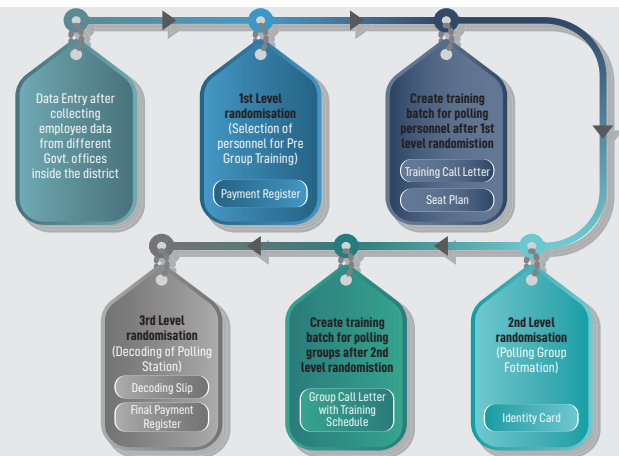
> " To conduct free and fair elections, it is very important to allocate polling personnel at polling stations by using an automated randomization process to maintain impartiality, which is not possible without the help of an IT Application. To perform this in an easier way, an online application, Polling Party Management System (PPMS) has been developed by NIC Assam and was successfully implemented in Bongaigaon District during Parliamentary Election 2019. It is found to be an excellent application with all requisite modules necessary for smooth working of the system.
>
> I congratulate the NIC team for putting in place this IT Application and wish all success in near future.
>
> **ADIL KHAN, IAS**
> **Deputy Commissioner**
> **Bongaigaon** "

Online randomization of polling personnel under Golaghat Election District in the presence of general observer during Lok Sabha Election 2019

Process flow of Polling Personnel Management System

Polling Personnel Management System (PPMS) is the outcome of all the experience gathered from previous elections in Assam.

Objectives

e-Nirvachan has been developed with the following objectives:

● To eradicate difficulties faced while using offline version of randomization software for the appointment of polling/counting personnel till the current year like data integrity, software maintenance, version control etc.

● To bring each automation under one umbrella in connection with polling personnel and counting personnel appointments of the election districts of Assam, fulfilling all the guidelines laid down by the Election Commission of India (ECI).

● To have a centralized secure online system, which can make the whole process of automation more robust, controlled, easily available from everywhere and a system with easier maintenance.

Application Workflow

At first, the District Administration collects the employee data list from various departments/offices in a specific format as per software data entry form, for example, employee name, designation, basic pay, date of retirement, home constituency, office constituency, educational qualification, mobile number etc. The collected data is then fed into the software by engaging data entry operators or office staff. After completing this data, entry of employees, polling station list and constituency list are prepared and updated in the software. As soon as the election date is declared, the process of training of polling personnel begins, and the software effectively manages the complete training process.

At first, information such as training venue, hall and capacity under hall is collected. Then the software picks up the required persons (presiding or polling) and arranges them within the hall. Thereafter, an order copy of training is generated and distributed to the employees. The order copy contains information such as venue, hall and date/ timings of training. There is one more facility to send SMS to the polling personnel about the training schedule. However, in order to use this facility, the District Administration has to purchase an SMS pack. In the same way, the software generates attendance sheet, payment register and identity card for the training batches.

After the training is over, the process of group formation of polling personnel begins. This is called second level randomization. There are certain conditions for group formation of polling personnel as per ECI guidelines. Same guidelines are also used in Panchayat Election. The conditions are:

● Polling person posted in a particular constituency should not come from the same home, residential or department

location constituency.

● At least, presiding and first polling person in a group should not be from the same office.

These conditions are strictly maintained in the software. However, the first condition is not possible for a single constituency district, and hence, those districts need to take permission from the Election Commissioner for flexibility of guidelines to be allowed. After group formation of polling parties, final appointment letter is generated and distributed through the department. The final appointment letter, generated through the above stage, does not reveal the polling station detail for the particular polling personnel group.

The actual polling station is available only after the third level of randomization. In this step, constituency wise polling stations for every polling personnel group are generated and displayed on a notice board on a day before election. Besides, an SMS alert facility is available. The SMS contains material receipt counter number, name and phone number of sector officials etc. On the day of material receipt, the polling personnel group directly comes to the said counter and can collect the polling materials instead of waiting in long queue.

There is one more feature to manage counting supervisor and assistant for counting of votes. Here, some of the polling persons available in the database are marked as counting supervisor and assistant and counting group is formed. Also, training is organised for the group in the same way as for polling personnel mentioned above.

All the randomization processes are done in the presence of an election observer. On satisfaction of the observer, the process is locked by the software. The **Product Version** I for e-Nirvachan (Assam) is available at *http://ppmsassam.gov.in*. The Application platform is PostgreSQL Database as the backend and PHP as frontend and third party library TCPDF6 for PDF report generation.

Target Audience
➦ Respective District Election Officer
➦ Respective Election Officer
➦ Manpower Management Cell
➦ Training Management Cell
➦ Polling and Counting Personnel

Features
Following are the main features of PPMS:

Data Entry/ Edit Module
Using this module, data from various State/ Central Government Department officials are entered into the system to make a complete database of available manpower in the district. A provision to import data from excel format (by converting to CSV), as per need, is also there to ease the process.

First Randomization
Using randomization technique, the system picks suitable personnel with required percentage of reserve personnel to be used as polling personnel.

Training Batch Creation and Generation of Training Letters
After first randomization, training venue and room wise training batches can be created through the system. Accordingly, all the training letters (office wise), including forwarding letters to the HoDs, can be generated accurately without any hassle. Since the volume of polling personnel data is generally high, using PPMS system simplifies the process of training letter-/forwarding letter generation etc., while ensuring accuracy.

Second Randomization
The Legislative Assembly Constituency wise random group formation process is termed as second randomization, and PPMS system has thefacility to do this within a few clicks. The process is also witnessed by election observers during the second randomization.

Generation of Group Letters/ Group Training Letters
After second randomization, all the appointment letters can be generated in

specified formats, and training schedule etc., can be dynamically added in the appointment letters itself, using the PPMS system.

Third Randomization
In this step, all the groups formed after second randomization are assigned polling station number randomly. This step is also required to be done in the presence of observer. The PPMS system can effectively and flawlessly-perform this function.

Counting Modules
Similarly, counting personnel for counting of votes can be drafted and appointed using the system by following all the randomization guidelines, and this has completely replaced the manual system used earlier.

Report Modules
The application has been enhanced with various types of report modules, and itenables decision-makingrelated to Manpower Management Cell (MPMC) and Training Management Cell (TMC).

Security Features
The security related modules of the application encompass measures taken to improve the security of the application by finding and fixing all the security loopholes.

Outcome
During Parliamentary Election 2019, total 14 Parliamentary Constituencies including 126 Legislative Assembly Segments of Assam implemented the online PPMS portal for randomization of about 2,70,000 employees from various State Governments/ Central Government/ PSU organizations, and all the District Election Officers smoothly completed the randomization process in due time. ∎

Artificial Intelligence in e-Governance Applications

Extensive use of Machine Learning & Deep Learning

Artificial Intelligence development frameworks play a crucial role in enabling faster delivery of models built on them. They help provide data driven insights. Here, Machine Learning & Deep Learning Case Study is being considered for Object Detection, which may find an application in any other area where infrastructure assets are being created by the government.

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Artificial Intelligence (AI) is the intelligence demonstrated by machines in which computer systems perform tasks as humans like speech recognition, decision-making, language translation etc. AI has the ability to automate repetitive tasks, make connections, see relationships and make predictions with reasonable levels of accuracy. One requirement of using AI Technologies is to read and learn about various algorithms before applying as there are many options to choose from and being an emerging technology, new options are evolving fast.

The focus of India's National Artificial Intelligence Strategy is not only on economic growth, but also on social inclusion. Niti Aayog, in its National Strategy for Artificial Intelligence, has identified "AI for All" as the theme for leveraging full potential of AI to meet the country's unique needs and aspirations. It has identified five critical sectors for AI intervention, namely Healthcare, Agriculture, Education, Smart Cities & Infrastructure and Smart Mobility & Transportation.

Given the context of societal inclusion, in one of the key sectors of development i.e., Infrastructure creation for the citizens by ministries, NIC has extended support in Mission Mode Projects for faster delivery of services to citizens.

Citizens participated through web, Mobile Apps and Citizen Service Centres. It was decided to explore potential insights that can be gained in the effective implementation of these services, utilization of funds and creation of assets by using AI & Deep Learning.

The applicants upload photos of progress of work to get instalments from these portals through Direct Benefit Transfer. For establishing right utilisation of funds under these schemes, physical verification checks are conducted by officials before transfer of funds to a beneficiary's bank account. Sometimes, this leads to delay in timely disbursement of instalments. The subsequent part of the article will show how this cycle time is cut using AI modelling, and there will be a walkthrough of the process of AI model building.

Technology Brief

Data readiness for use of AI in eGovernance

Next step was to assess data readiness of the organization for applying AI Technologies. Answers were required for the following questions:

- Is there sufficient data available for machine to learn patterns from?
- Is data being captured at source?
- Is it in a form that can be used as is or needs to be cleaned, scaled, or transformed?
- Is sufficient amount of annotated data available for supervised learning?

Swachh Bharat Urban was capturing geo-tagged constructed toilet photo images with help of a Mobile App developed by NIC. This provided for uniform 65K sized images that were being stored in a file folder, in addition to a copy in archived database. These files in folders were easily transferred for both Machine Learning Exercise and Deep Learning Model Building.

Platform availability for undertaking the exercise

It is a known fact that image processing is a compute intensive exercise and Deep Learning is the way to go. Centre of Excellence in Artificial Intelligence created the AI platform by acquiring two numbers of Deep Learning Server for AI Research (DGX I) with two Central Processing Units (CPUs) & eight Graphical Processing Units (GPUs) each and put them on

cluster for workload management with Kubernetes. Dockers were installed for running Tensorflow, OpenCV for Deep Learning and TensorRT for inferencing.

Annotated data availability

For the model to be trained using supervised learning algorithms, it is required to prepare a set of annotated training samples, randomly selected from the universe of unannotated image set. AI and Machine Learning have a limited ability to analyze data without labels. Same is true in context of image processing also. Hence, the images were annotated with bounding boxes both for Machine Learning & Deep Learning. Deep Learning requires a lot of annotated data. However, since there were only two classes i.e., detection of beneficiary and detection of toilet seats, few batches of 2000 - 3000 records each, both for Urban & Grameen toilets images could be trained with. Synthetic data was also created for hardening the model.

How it worked?

Hypothesis for training model

AI modeling usually involves building ahypothesis based on features or attributes, which may be considered as independent variables and the hypothesis may be compared with the ground truth or the value of the dependent variable. There is an attempt to find a best fit between the model and the ground truth such that the residual error between the two is minimized and the hypothesis is an accurate predictor of the dependant variable.

The hypothesis in this model building exercise is the classification of objects detected in an image as belonging to either of the two classes: beneficiary or toilet seat with at least 90% average precision for both the classes and a recall >0.95 (recall means if an object is there, it will be detected) to be identified as a good object detection model for the e-Governance application under consideration.

Choosing the right algorithm

Model building is a heuristic exercise that often involves many rounds of iterations with different algorithms to see what gives the best insight from the data. Metrics are there to compare the results from these models. For Machine Learning exercise, HAAR Cascade Frontal Face Default Classifier was chosen as it can detect faces and has a very high detection (true positive rate) and very low false positive rate always. k-Nearest Neighbor (KNN) & Scale Invariant Feature Transform (SIFT) were chosen for prototyping in toilet seat detection as SIFT can robustly identify objects even among clutter and under partial occlusion. This is because the SIFT feature descriptor is invariant to uniform scaling, orientation and illumination changes, and it is partially invariant to affine distortion.

Deep Learning was tried with You Only Look Once (YOLOv3) using Darknet feature extractor. YOLOv3 is an open source Convolutional Neural Network (CNN) architecture framework, which uses a variant of Darknet. It is a 106 layer neural network trained on Imagenet. YOLO is a popular framework as it has

both accuracy and speed. Stochastic gradient descent was used to reach the optimum.

Features

Model Building Exercise

Deep Learning model building for Swachh Bharat Urban was done using Transfer Learning with weights loaded from darknet53.conv.74, using 10% of training dataset as cross validation set randomly. The model performance was measured against this cross validation set also called test set. Similar exercise was done for Swachh Bharat Grameen for two rounds of iteration of pure model building. Then the parametric weights obtained for the model were used for hybrid model training of using Grameen weight on urban dataset and viceversa. Around 92% average precision was obtained through this exercise. Nearly 11000 images were annotated.

Then 5000 more images were created synthetically by cutting the toilet seat and beneficiary photos from original images and using scripting to put them randomly on different background. This put them in different positions, illuminating conditions and angles using translation, rotation etc. Hence, the model can be hardened for predicting data even in the absence of annotated dataset that modelled for these conditions. 100% mean Average Precision (mAP) was obtained for the model when weights from this annealed model on the actual dataset were used.

Here are the first and last couple of batches of model training.

Beneficiary and toilet seat detection in Swachh Bharat Scheme

Training dataset – Urban 1st batch	Training with starting weights darknet53.conv. 74	Beneficiary detection Average Precision percentage	Toilet seat detection Average Precision percentage	Remarks
1866 records	2000	75.84	83.27	It can be seen that object detection average precision oscillates for a few epochs and is best at 12000 weight. Then it starts to peter out. The reason is YOLOv3 uses mini batch Stochastic Gradient Descent to converge to local optima with slow learning rate.
	3000	73.83	81.96	
	8000	75.59	82.91	
	10000	76.83	85.53	
	11008	76.31	83.92	
	12000	77.25	85.23	
	13008	76.22	84.99	
	14000	76.19	85.89	
	15008	75.69	85.79	

Table 1: Object detection by Deep Learning in Swachh Bharat Urban

Case I – Swachh Bharat Urban – Pure Model Training

Initial epochs were run on 1 GPU and then on multiple GPUs on DGX servers.

Note on Confusion Metrics

TP = True Positives, TN = True Negatives, FP = False Positive, FN = False

	Class 1 Predicted	Class 2 Predicted
Class 1 Actual	TP	TN
Class 2 Actual	FP	TN

Table 2: Predicted Classes

Negative, P - Precision, R- Recall, F1-Score means low false positives & low false negatives, IoU – Intersection over Union, mAP = mean Average Precision.

Since batch-wise stochastic gradient descent uses randomness and reaches local optima, after nine batches of training and cross-validating, annealing using synthetic data was used for hardening the process of model building. Then it was finally used on real dataset to reach global optima.

Impact

It will be a great help for the beneficiaries of government schemes if the system can prompt them to submit proper images so that chances of rejection of uploaded images get minimized. This will reduce pendency of applications for clearance, and consequently lead to speedier transfer of funds to citizens.

Application Areas

A Mobile App has been developed to facilitate citizens to check the appropriateness of constructed toilet images uploaded. Using this AI model inference, the App can be used to check for beneficiary and toilet seat at the time of uploading of constructed toilet images and promptly alert users of improper photo uploads. Further experiment is being done on the face verification of applicant's photo with the beneficiary image in constructed toilet photo uploaded using FaceNet.

Case II – Swachh Bharat Grameen – Hybrid Model Training with Annealing

Training dataset – Grameen 3rd batch	Starting with Urban-Grameen Synthetic Model weights yolo-obj_66024	Beneficiary detection Average Precision percentage	Toilet seat detection Average Precision percentage	Remarks
3000 records	67048	90.91	90.12	Cross validation is used by randomly shuffling between training and test set to increase performance of the model as seen next.
	68072	90.91	90.53	
	69000	90.91	90.04	
	70024	90.91	90.33	
	72072	**90.91**	**90.67**	
After Randomly shuffling 3000 records & using yolo-obj_72072	73000	100	100	P = 0.99, R = 1, F1-score = 1, TP = 707, FP = 5, FN = 0, IoU = 85.48 & mAP = 100%
	74024	**100**	**100**	**P = 1, R = 1, F1- score = 1, TP = 707, FP = 0, FN = 0, IoU = 86.79 & mAP = 100%**
	75048	100	100	P = 1, R = 1, F1 - score = 1, TP = 707, FP = 1, FN = 0, IoU = 86.46 & mAP = 100%

Table 3: Object detection, Grameen Hybrid Model Training

Case III – Swachh Bharat Urban – Hybrid model training with Annealing

Training dataset – Urban 2nd batch	Starting with Urban-Grameen Synthetic Model weights yolo- obj_66024	Beneficiary detection Average Precision percentage	Toilet seat detection Average Precision percentage	Remarks
2075 records	67048	90.86	88.43	
	68072	90.91	88.87	
	69000	**90.91**	**89.45**	
	70024	90.91	81.42	
After randomly shuffling 2075 records & using yolo-obj_69000	70024	100	99.97	P = 1, R = 1, F1- score = 1, TP = 613, FP = 2, FN = 0, IoU = 82.83 & mAP = 100%
	71048	100	100	
	72072	100	99.97	
	73000	100	99.97	
	74024	**100**	**100**	**P = 1, R = 1, F1- score = 1, TP = 613, FP = 1, FN = 0, IoU = 84.29 & mAP = 100%**
	75048	100	100	P = 1, R = 1, F1 - score = 1, TP = 613, FP = 1, FN = 0, IoU = 83.56 & mAP = 100%

Table 4: Object detection, Urban Hybrid Model Training

Summary

The model built showcased how the building of such models can be taken ahead as it will be useful in detecting constructed and under construction government assets in similar schemes like in Prime Minister Awas Yojana, Atal Mission for Rejuvenation & Urban Transformation etc., by training in a similar manner. ■

BLOCKCHAIN TECHNOLOGY

A mechanism revolutionizing multiple sectors, eliciting accountability and eliminating errors

Since the blockchain database system provides security, trust, provenance, traceability and availability, the stakeholders of various business systems/ organizations can collaborate with each other. This technology has been initially experimented in the finance sector as in Bitcoin network, insurance payments and cross border payment networks. As a Proof of Concept, Blood Bank Supply Chain Model has been developed and tested on Hyperledger Sawtooth Framework.

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REUBAN K.

A business involves transactions and information exchange among various stakeholders. Since most of the existing systems are centralized, there is greater risk to security, and this necessitates the need for a secure and shareable system to help stakeholders interoperate efficiently. Blockchain is a distributed system where transaction records are bundled in blocks and linked with previous ones. Transaction data within a block is secured because it is encrypted and digitally signed. Bitcoin network is a pear to pear payment network, and it is an application of blockchain technology.

Blockchain Ecosystem

Blockchain is a decentralized distributed database (ledger) of immutable records accessed by various business applications over the network. Client applications of related businesses can read or append transaction records to the blockchain. Transaction records submitted to any node are validated and committed to the ledger database on all the nodes of blockchain network. Committed transactions are immutable because each block is linked with its previous block by means of hash and signature values. Protocols such as Gossip and Consensus ensure that the submitted transactions are transferred to all nodes and committed on all blockchain nodes consistently.

As shown in Figure 1, blockchain ecosystem consists of blockchain client, blockchain node, blockchain network, transaction processor/ smart contract and consensus process.

Blockchain client is an application that creates transaction message in a prescribed format and submits it to blockchain node through web API. It may be any existing application, which posts transaction message to blockchain node. Clients are restricted using Public Key Infrastructure (PKI) technology at blockchain node level.

Blockchain node is a server node that runs blockchain services responsible for receiving the transaction and transmits the transaction to other blockchain nodes. With respect to the design, the node participates in consensus process to commit the block of transaction data to ledger database.

Blockchain network is a network of linked nodes used for read, write transactions into ledger database. The topology (as shown in Figure 2) is based on the nodes participating in consensus process. Traditional systems are centralized where all data and decision-making is concentrated on a single node or cluster of nodes. In decentralized systems, the data and decision-making are spread out among a large number of nodes. These nodes maintain copies of the shared database and decide
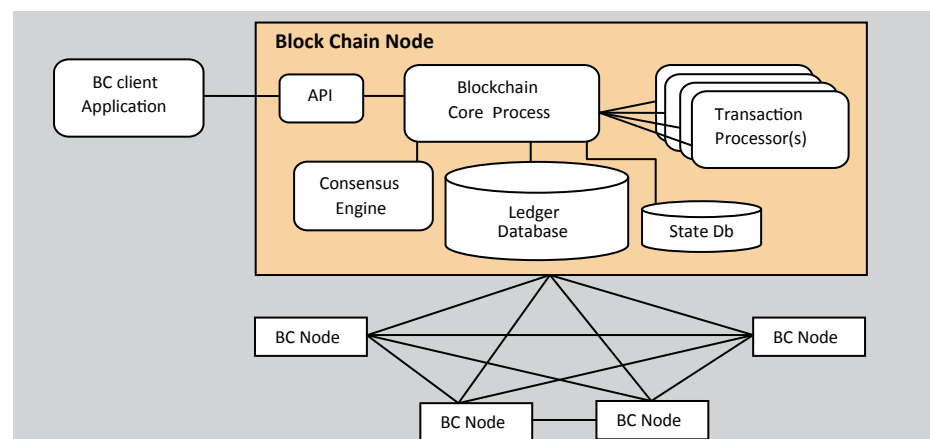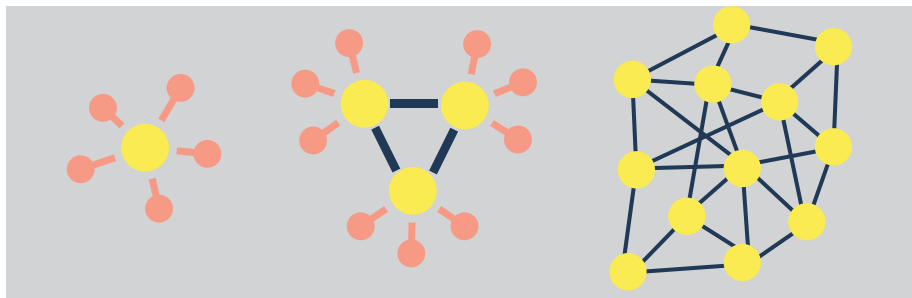

Fig. 1: Blockchain ecosystem

Fig. 2: Blockchain network topology (Centralized, decentralized, distributed)

among themselves which data is to be committed to the database using consensus mechanism. Decentralized networks can be an interconnection of centralized or hub-and-spoke type networks. A distributed network is a special case of decentralized system where every single node in the network maintains the shared database and participates in consensus to determine which data is to be committed to the database.

Blockchain Types

Public, Private and Consortium: In public blockchain, anyone can read and submit transaction, and take part in consensus process. Bitcoin and Ethereum are examples of public blockchain. Private blockchain is controlled by only a single body or an organization that controls who can read and submit transaction, and take part in consensus process. Consortium blockchain operations are controlled by a selected set of participating organizations. Public blockchain is called permission less blockchain. Private and consortium blockchain are called permissioned blockchain.

Transaction Processor/ Chain Code/

Smart Contract is a process that runs at blockchain nodes for processing the transaction data and maintaining the status in ledger database. It is called by blockchain process when the transaction commit is started. During the process, it can call or execute other business process tasks transparently before committing the transaction.

Consensus is a procedure to select a leader node, which decides whether the block of transactions is to be committed or rejected. Earlier versions of blockchain system used Proof of Work (PoW) for consensus process. Every node or participatory node is given a mining task, and a node elected as leader completes the mining task first. Mining task is to find or calculate a certain pattern value of hash value by adding nonce to current hash. Node that participates in mining process requires heavy computing resources. Latest consensus protocol uses PoET, which is called "Proof of Elapsed Time". Every node in the consensus process selects random time and keeps decreasing. The node that reaches zero first is selected as leader.

Transaction is a unit of business data

within Hyperledger. **Block** is a set of transactions bundled with signatures and hash value of previous block. Genesis block is the first block of chain created during installation and configuration.

Merkle Tree is a tree data structure (as shown in Figure 3) in which leaf node holds hashes of every transaction and intermediate node holds hash calculated from immediate child nodes. In blockchain, a block consists of one or more transactions and its respective tree of hashes. In a distributed system, this tree is used to maintain data consistency among all participating nodes.

Ledger/Chain Database is a key-value database for a chain of serialized blocks. One block may contain one or more transactions.

State Database is a key-value database for storing transaction state and links of its related transactions.

Hyperledger Sawtooth Framework

Hyperledger Sawtooth is an enterprise blockchain platform for building distributed ledger applications and networks. It is an open source project under Hyperledger developed by Intel. Sawtooth core is a central Sawtooth software, which contains Validator, REST API and Transaction Processors. The Sawtooth Architecture (as shown in Figure 4) separates these core functions from application-specific business logic, which is handled by transaction families.

Validator is responsible for validating batches of transactions, combining them into blocks, maintaining consensus with the
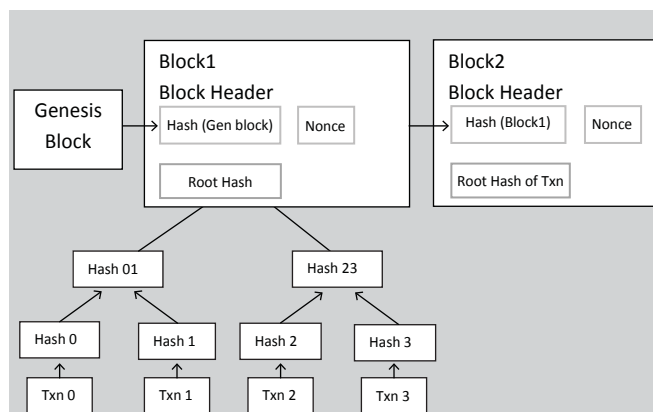

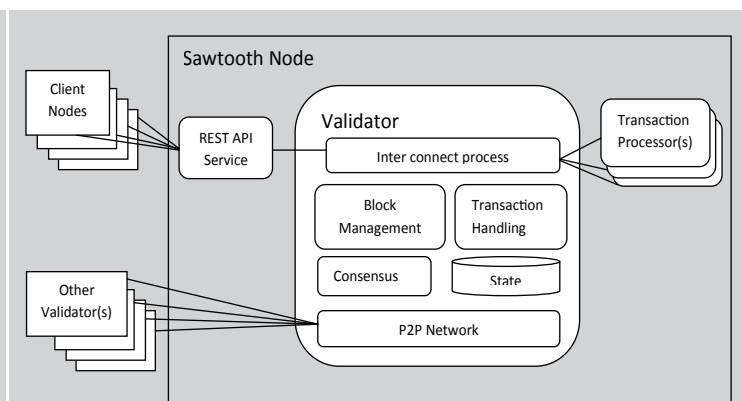Fig. 3: Blockchain transactions hashed in Merkle Tree

Fig. 4: Sawtooth Node High-level Architecture

Sawtooth network and coordinating communication between clients, transaction processors and other validator nodes.

REST API is a service used by client applications for submitting transactions to blockchain node. It is also used for fetching transactions, blocks and transaction status information from blockchain database *(https://ipaddress:port/blocks, https://ipaddress:port/transaction/transactionid).*

Transaction Processor validates transactions and updates its state database based on rules defined by the associated transaction family. Sawtooth includes default transaction processors for on-chain permission and configuration settings.

SDK support for application development: Sawtooth provides software development kit for creating and manipulating transactions at client and back end transaction processor level. Sawtooth supports Python, Go, NodeJS, Java and C++.

Consensus protocol supported by Sawtooth: Devmode, PBFT (Practical Byzantine Fault Tolerence), PoET SGX (Software Guarded eXtension), PoET simulator

DevMode is a simplified random ledger algorithm for development and testing.

PBFT is a leader based, non-forking consensus algorithm, and it is ideal for smaller consortium style networks.

PoET SGX: The Proof of Elapsed Time (PoET) Consensus method utilizes a "trusted execution environment" called SGX provided by Intel Processor. It elects individual peers to execute requests at a given target rate.

PoET Simulator: It is same as PoET SGX, but it has simulated SGX environment.

Other blockchain platforms: Ethereum, R3 Corda, Multi Chain and Hyperledger Fabric

Blockchain Technology Use Case: Blood Bank Supply Chain

Blood Bank System

The recording of blood donations is done with paper and pen, and parameters like group, expiry date, and temperature are
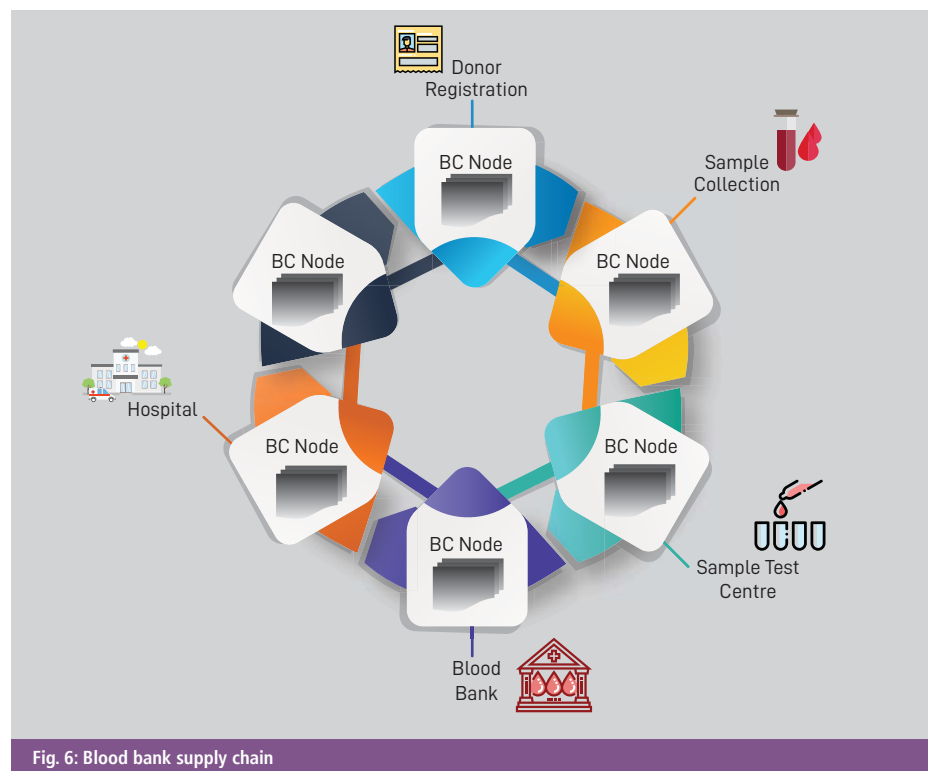

Fig. 5: Blood supply chain workflow
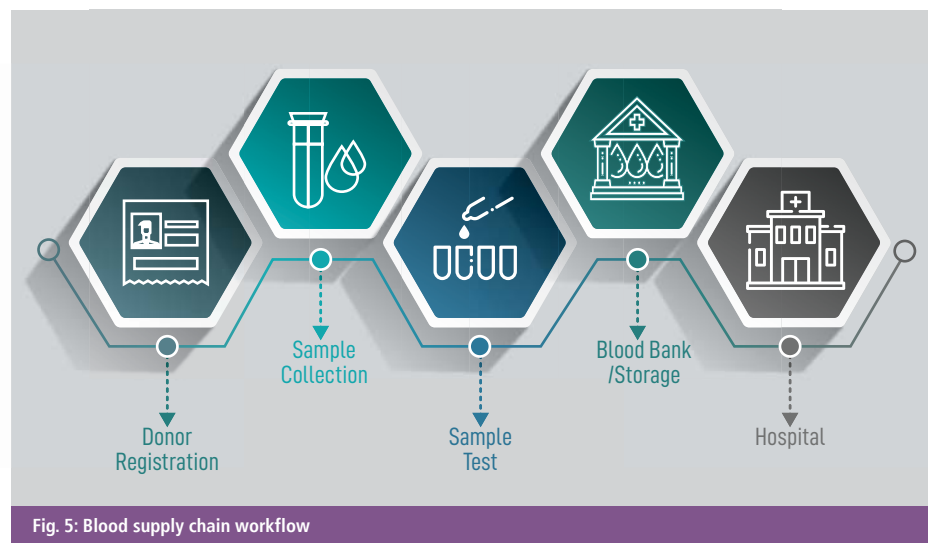
maintained manually. It could be fatal to patients if anyone receives infected/ contaminated blood. There is no proper way to verify the cleanliness of blood donated without testing it. There is no consolidated repository for the information of blood. Right from donor registration to hospital, multiple actors are involved in the process such as donors, testers, camps, blood bank, doctor and hospital.

Use case

In the complete supply chain, recording transactions right from donor registration to patient and other important properties of blood such as group, test report, expiry date and temperature are maintained on blockchain.

As a Proof of Concept, the above supply chain workflow has been implemented on Hyperledger Sawtooth Framework with six nodes. In this case, the client application has been implemented in Python and NodesJs. Backend transaction processor is implemented in Python.

Fig. 6: Blood bank supply chain

Comparison between Blockchain Platforms

	Sawtooth	Fabric	Ethereum	Quorum
Type based on availability to user	Private	Private	Public	Private
Sector focus	Any	Any	Any	Financial
Consensus	Proof of Elapsed Time	Proof of Stake	Proof of Work	Raft
Multi-tenancy	Using family	Using channels	Not supported	Not supported
Language support	Python, GO, Java, NodeJs, C++	Python, GO, Java, NodeJs	Solidity	Solidity
Throughput	~2000tps	~2000tps	~ 500tps	~ 100tps
Security	PKI based, Supports access control policies	PKI based, Supports access control policies and network security	Need to encrypt the data	PKI based
Scalability	Scalable, Performance dependent on consensus algorithm and number of nodes	Scalable, Performance dependent on consensus algorithm and number of nodes	Scalable, Performance dependent on consensus algorithm and block size and compute power	Scalable
Project type and maintainer	Open source and maintained by Intel	Open source and maintained by IBM	Open source	Open source and maintained by JP Morgan
Support and documentation	Extensive documentation for developers and administrators	All support documentation is available as GitHub.	Online documents are available. Not in detail.	Not in detail

Criteria for Adopting Blockchain Technology

Following are some of the questions to assess the need of blockchain technology for existing/ new applications:

Is there a need to remove intermediaries that add complexity?

In order to complete certain main business process, some sort of sub process is required. For example, for loan sanction, the applicants' KYC and income status need to be verified. For recruitment process, employee verification including personal details, qualification details and experience details needs to be done. Nowadays, the above verifications are outsourced to third party agencies, which is time-consuming and costly.

Is non-repudiation i.e., the proof that someone submitted a transaction, needed?

After transporter delivers goods or food grains to retail shop, a transaction about the delivery on blockchain ensures that it has been delivered because it is accessible to supplier. Retailer cannot deny the delivery and delay the payment. At some places, a proof of the financial transaction needs to be provided for getting income tax relief or other benefits.

Is tamper resistance needed?

System that ensures the transaction data can't be tampered. In traditional system, the transaction data can be tampered whereas in the same case in blockchain, it is very difficult because of its immutable property.

Does data need to be shared across multiple entities?

In the business process, transaction data requires to be shared among various stakeholders.

Do multiple entities need to modify the data?

Suppose a business needs to be accessed by different entities and modify. A complete trace of what has been modified and by whom is required.

Conclusion

While selecting the sector for adopting blockchain technology, essential care needs to be taken to assess its suitability for the sector. Several blockchain platforms are currently available with different features. Hence, the selection of suitable platform for an application requires detailed survey and testing. Identifying the best platform for different classes of application requires detailed study and evaluation. ■

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Appscape

The Mobile Application Nodal Centre, along with the Competency Centre, has been engaged in building mobile competency and providing easy deployment of Mobile Apps at the NIC App Store. NIC has acquired accounts at Google Play Store and iOS App Store, which are available free of cost for Apps developed by it. There are around 270 and 30 Apps on Google Play Store and iOS App Store respectively.

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For Apps uploading queries:
eMail: mobileapps-nic@nic.in
Phone: 011 - 2430 5494 (Deepak Mittal)

Visit the Mobile App Store
http://egovmobileapps.nic.in

DEA-eSamikSha

Developed by NIC Cabinet Secretariat Informatics Division, DEA-eSamikSha App helps monitor follow-up actions on announcements made by the Minister of Finance during the Union Budget in the Parliament every year. The follow-up action in respect to each announcement is expected to be updated by the concerned Ministry/ Department, which is also responsible for the implementation of announcements, as and when the status changes or at least once every month. Different users such as the Ministries and Departments can securely access the system through a login system/ password. The Android and iOS App can also be used to review follow-up actions in respect to various meetings and action points emanating from them.
The App aims to:

➥Fast track the compliance of pending actionpoints, proposals, issues, projects, schemes, targets etc. ➥Automate the monitoring of actionable items from submission to compliance online. ➥Enhance e¬fficiency, bring transparency and reduce the need of protracted correspondence. ➥Improve Government to Government (G2G) and Government to Business (G2B) communication and viceversa. ➥Help monitoring agencies give further directions or remarks and obtain various exceptional and compliance status reports on the fly.

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https://play.google.com/store/apps/details?id=com.nic.deaesamiksha
https://itunes.apple.com/in/app/DEA-eSamikSha/id1462253328

PCTS

Pregnancy, Child Tracking & Health Services Management System (PCTS) Apphas beendeveloped by NIC Rajasthan for the Department of Medical, Health & Family Welfare. Covering all the functions related tothe Reproductive & Child Healthprogramme, the Android App has helped eliminate time gap between occurrence and reporting of health services provided to beneficiaries by Auxiliary Nurse Midwives (ANMs).
The App features:

➥Monthly Work Plan - Providing monthly work plan of ANM for services due during a month and mentioning beneficiary's name, service name and date when service is to be provided ➥Case Details - Providing details of services delivered to a beneficiary ➥Ante Natal Care (ANC) - Providing list of beneficiaries (pregnant women) whose ANC is due and helping ANM capture ANC details ➥Post Natal Care (PNC)–Providing list of beneficiaries due for PNC and enabling capture of PNC details ➥Child Immunization - Providing list of children due for immunization and enabling capture of immunization details ➥Maternal Death - Enabling entry of details of maternal deaths ➥Infant Death - Enabling entry of details of infants/children deaths ➥Educational Videos – Providing educational videos for ANMs and beneficiaries

Queries: Tarun Toshniwal (tarun.toshniwal@nic.in)

https://play.google.com/store/apps/details?id=com.pcts.pcts.nic&hl=en_IN

Poll Manager

Meant for Chief Electoral Officer, Poll Manager/ eDooth App was implemented for the management of polling activities during the Parliament Election 2019 in Kerala. Poll day reporting module, monitoring of assured minimum facilities at polling stations, directory of officers with search facility, chat, message broadcast, online complaint redress mechanism, FAQs, download centre and SOS message handling were the major features of the Android App. Developed by NIC Kerala, the App also had another important feature, poll day real time monitoring based on 19 questions on poll day and penultimate day, along with an SOS facility for polling officers to report crises during the poll to the concerned authorities. The scope of information technology was explored to the best to ensure close monitoring and prompt follow-up actions during the election.

The App was extensively used by Returning Officers, Assistant Returning Officers, Nodal Officers, Sector Officers, Village Officers, Presiding/ Polling Officers and other election related officers. It was instrumental in collecting and disseminating important information like poll started, mock poll conducted, hourly polling percentage, poll closed status etc., from each polling station in Kerala.

TREND ONMobile

Developed by NIC Kerala, TREND OnMobile App was designed for the dissemination of Lok Sabha Election 2019 results. The Android App provided results in near real time from the counting centre. The application architecture was used with a NO-SQL JSON data source for a large scale rollout. The screen refresh rate of user device was configurable and controllable by APIs. The APIs were designed using core PHP.

The App provided House of People Constituency wise summary of votes scored by candidates. Its dashboard showcased leading and trailing candidate data with total number of votes lead with party details. Drill down UI screens were provided to get vote details upto Legislative Assembly Constituencies level. Infographics were provided in the dashboard tab to see party wise lead in the state. A 'LIVE' indication was displayed in the screen during counting time. APIs were designed to send notifications to users regarding various updates. The Mobile App has been developed in tandem with the Trend portal for dissemination of election results during the past few years.

SPARK OnMobile

A mobile initiative by the Finance Department, Government of Kerala, SPARK OnMobile App is meant for employees whose service details are managed by 'Service and Payroll Administrative Repository for Kerala (SPARK)', a project executed by NIC Kerala State Unit. The Android App facilitates employees to view their salary slips, apply/ manage leave applications, request for outside duty and compensatory off etc. SPARK covers all the State Government employees whose salaries are paid through the State Treasury, which also includes the government aided institutions. Every employee is identified by a unique Permanent Employee Number (PEN) in SPARK.

Employees can use this App with their registered mobile numbers in SPARK, along with the PEN numbers. An OTP based authorization is also enabled to prevent unauthorized access to personal information. The leave management module enables them to apply for fresh leaves, cancel leaves, extend leaves and to view the history of leaves availed in a particular year. Leave balance can also be viewed by employees in their dashboards.

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Queries: T. Mohana Dhas (mohandhas.t@nic.in)

Queries: T. Mohana Dhas (mohandhas.t@nic.in)

https://play.google.com/store/apps/details?id=in.nic.kerala.election

https://play.google.com/store/apps/details?id=trend.kerala.nic.in

https://play.google.com/store/apps/details?id=in.gov.kerala.spark.onmobile

Election Duty

Developed by NIC Rajasthan, Election Duty App was designed to manage deployment of polling personnel during Parliament Election 2019. Timely delivery of appointment letters to staff deployed for polling/ counting parties has always been a challenge for the office of District Election Officer. The Android App facilitates the election office as well as staff with timely delivery of appointment letters and receipt of duty orders. It uses an OTP based authentication to ensure authorized access. Developed in local Hindi language, the App was used at a large scale during the Lok Sabha Election.

Technologies used for development are Dot Net WebAPI, Microsoft SQL Server, Android (Native Java) and Apache J Meter.

The App features:

➡**Delivery of orders:** This is used by OIC/ HOD at office level to download forwarding letter, tameel list and duty orders after OTP based authentication.

➡**Receipt of orders:** This facilitates an acknowledgment of duty orders received and served/ not served by OIC/ HOD.

➡**Training schedule -** This option provides complete training/ duty details for an individual employee.

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Meghalaya Voters Queue

Helping voters avoid standing in queues for long hours during voting, Meghalaya Voters Queue App aims to provide information about queue lines at polling stations. Developed by NIC Meghalaya, the Android App has been introduced by the Chief Electoral Officer of Meghalaya to enable voters to check the live status of queues at their polling stations.

Booth Level Officers can also use the App and update the number of queues at polling stations on polling days at frequent intervals. Voters can check the number of queues at their respective polling stations by entering the EPIC Number. Once they submit, the system shows the number of queues at a polling station mapped with the EPIC Number. It also shows names of constituency and polling station.

The App is available in two modes. The first scenario is when there is no internet connectivity/ data card at a polling station then SMS based mode can be used. The second scenario is when polling stations have internet connectivity/ data card then the Mobile App can be used.

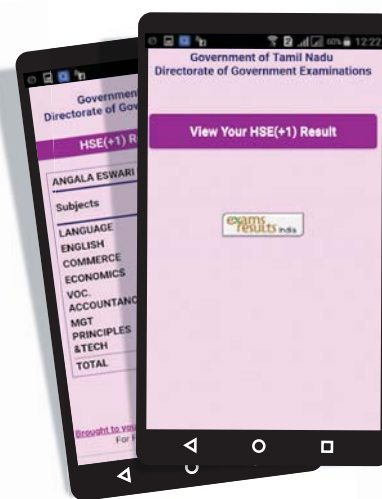*Queries: AiborlangWanswett (aiborlang.wanswett@nic.in)*

TN HSE(+1) Result

Student and parent communities eagerly wait for annual examination results every year. Owing to high mobile penetration, student communities use mobiles to look for their educational material and results. Though TN Board Examination results are mobile compatible, TN HSE(+1) Result App has been designed to enable easy access to related information such as subject wise marks. Developed by NIC Tamil Nadu, the Android and iOS App helps more than 8 lakh students and their parents view results while being at home. Candidates need to provide their registration number, along with date of birth to view results.

The Android App is developed using Apache Cordova with the existing RWD application. It requires Android 4.1 and up and is compatible across devices including tablets. The App invokes a REST based Web API, using .NET technologies. The back end database is SQL 2014 in-memory DB for an on the fly delivery of desired results. The App has received good response, with more than 10,000+ installations. The iOS App is natively developed in Swift 4.2, Xcode 10.1 with iOS Mojave v.10.4. It requires iOS 10.0 or later and is compatible with iPhone, iPad and iPod touch.

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https://play.google.com/store/apps/details?id=rajasthan.nic.deojodhpur

https://play.google.com/store/apps/details?id=meg.voters.queue

https://apps.apple.com/gb/app/tn-hse-1-result/id1462405434
https://play.google.com/store/apps/details?id=io.cordova.myappac201c

Pro-Bitcoin Ohio Bill promotes government adoption of blockchain

133rd General Assembly
Regular Session
2019-2020   H. B. No. 220

Representative Carfagna

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A BILL

To enact section 9.16 of the Revised Code to allow   1
a governmental entity to utilize distributed   2
ledger technology, including blockchain   3
technology.   4

A bill introduced in the Ohio House of Representatives urges government entities to adopt blockchain, the technology underpinning bitcoin. Republican state representative, Mr. Rick Carfagna sponsored the bill. The legislation, called House Bill 220, is a part of Ohio's plan to provide a legal framework for distributed ledger technology such as blockchain. The legislation would enable the establishment of a decentralized online record for transactions such as car titles or hunting licenses, according to Cleveland.com.

Ohio has been making strides to become more crypto-friendly as part of a major effort to woo tech entrepreneurs to transform the state into a blockchain hub.

In August 2018, Governor John Kasich signed a bill that recognized the use of blockchain-based transactions as having legal bearing in a court of law. The bill made Ohio one of the first U.S. states to provide legal protection to companies developing new uses for blockchain. In November, Ohio became the first US state to allow businesses to pay taxes using bitcoin. The state government partnered with crypto payment processor BitPay to manage the payments in crypto and conversion to dollars.

The idea was the brainchild of Ohio's Republican state treasurer, Mr. Josh Mandel, a cryptocurrency fan who says bitcoin is "a legitimate form of currency." Then, in April 2019, Ohio's Republican Congressman, Mr. Warren Davidson — an avowed bitcoin fan — introduced federal legislation that would exempt cryptocurrencies and ICOs from US securities laws.

As CCN reported, the Token Taxonomy Act would amend the Securities Exchange Act to specifically exclude cryptocurrencies from securities laws.

Source: https://www.ccn.com

Record-breaking chaotic data transmission system used in China

Engineers in China have used a chaos-based system to pipe data securely through a fibre-optic at a rate of 1.25 gigabits per second across a distance of 143 kilometres. Mr. Hongxi Yin, Mr. Qingchun Zhao, Mr. Xiaolei Chen, Mr. Hehe Yue and Mr. Nan Zhao of the Lab of Optical Communications and Photonic Technology, School of Information and Communication Engineering, Dalian University of Technology, and their colleagues Mr. Dongjiao Xu and Mr. Ying Chang of HAEPC Information and Telecommunication Company, in Zhengzhou, describe details of the achievement in the International Journal of High Performance Computing and Networking. The team points out that their greatest success in this physical form of encryption was in the use of off-the-shelf components. They add that this keeps costs down significantly. Moreover, there is no need to use dispersion compensating fibre (DCF) or forward-error correction (FEC).

The researchers offer a rationale for the need to develop such high-speed, long-distance secure optical communications technology. High-speed secure message transmission and exchange is they suggest, an essential part of modern life at the individual, business, organisational, and governmental levels. "Modern information networks provide convenience for personal message transmission, national economic and technological development, national defence construction, battlefield communications and so on", they explain. However, it also brings new problems such as personal information, governments, enterprises, defence and other secure message leaks and attack. "These have been a serious threat to economic, technological development and social stability, and even national defence security," the team writes.

The record-breaking physically encrypted transmission of 1.25 gigabits per second over 143 kilometres is a major advance. The team, however, points out that they can achieve double that data rate over a shorter range, 25 kilometres. It is only a matter of time and development before the longer distance can sustain the higher data rate.

Source: https://www.inderscience.com

DG, NIC, reviews operations at Software Development Unit, Pune

DG, NIC, being welcomed by the admin staff

Project review with Group Heads in progress

Dr. Neeta Verma, Director General, NIC, along with Shri Nagesh Shastri, DDG, NIC HQ, made a visit to NIC Pune on 14th May 2019 for a review meeting. An interaction was held with Shri R.R. Rane, DDG & OIC and the Officers of GRAS Project team to assess the prospects of productizing the Finance Department Applications for a national roll-out. They also interacted with Shri Ashish Shiradhonkar, HoD, eCourts, to discuss virtual courts and implementation for eChallan. This was followed by their visit to NIC Pune Office wherein they took a tour of the Network Operation Centre (NOC) for National Knowledge Network (NKN).

Detailed presentations on major software development projects such as National Generic Document Registration System, Maharashtra State Registration, Rural & Urban Land Records and Transport were made by Shri R.R. Rane and other HODs of various project groups. DG also interacted with the Officers of STDC, Nagpur.

Addressing the Officers and staff at NKN hall, Dr. Neeta Verma appreciated the efforts put in by NIC Pune with respect to the software projects and services offered by NDC and Cloud Division. She underscored the need to have a collaborated work environment by the software development group and the infrastructure group such as NDC to ensure smooth execution of projects. DG also mentioned that NIC Pune is mainly meant for software development, and therefore, the Centre is expected to come out with software solutions for rollout across the nation.

- GIRISH M. PHEGADE, PUNE

DPE rolls out SPARROW (CPSE) developed by NIC e-Office Division

The Department of Public Enterprises (DPE) has rolled out Smart Performance Appraisal Report Recording Online Window (Central Public Sector Enterprises) - SPARROW (CPSE), an online Annual Performance Appraisal Report (APAR) system for writing and submission of APARs for the board level incumbents of CPSE. SPARROW (CPSE) system has been developed by NIC e-Office Division as a paid project, in co-ordination with the Public Enterprises Informatics Division (NIC) for DPE. The system is based on the lines of SPARROW being used by various groups belonging to All India Services.

This application aims to provide seamless movement of online APARs, which will lead to more probity and transparency in recording the reports. It will also facilitate better monitoring and timely completion of PARs as well as will provide immediate access to PAR dossiers to the authorized users.

The Public Enterprises Informatics Division (NIC), along with

Shri R.K. Chaudhry, Additional Secretary, DPE, addressing the participants during a workshop

DPE, has organized orientation programmes for the nominated Nodal Officers of all the CPSE and its Administrative Ministries through several live sessions and virtual workshops (videoconferencing sessions).

- SUBHENDU DEY CHOUDHURY, U.K. SWAMY
& P. RAJSHEKAR, DELHI

DG, NIC, holds review meeting at NIC Chandigarh, encourages Officers towards enhancement of services

Officers of NIC Chandigarh UT Unit interacting with DG

Dr. Neeta Verma, Director General, NIC, made a visit to NIC Chandigarh UT Unit on 3rd April 2019 to review the progress of ongoing operations. Shri Navneet Kukreja, DDG & Head, NIC Network and Mini Cloud Centre and Shri Vivek Verma, SIO, Chandigarh UT, provided her with the complete status and targeted milestones of the upcoming project, NIC Network and Mini Cloud Centre.

DG also chaired a meeting with NIC Chandigarh UT Officers wherein Shri Vivek Verma briefed about the ongoing projects and support being provided to Chandigarh Administration by NIC in all the ICT initiatives. In an encouraging interaction, DG gave important suggestions to overcome challenges and improve upon the systems. Discussing about the Network & Data Centre Services being provided by the Unit, which is also serving as a State Data Centre, she emphasized the importance of cyber security and advised to check for qualitative improvement and perform regular analysis.

In her concluding address, Dr. Neeta Verma motivated the team to put in efforts to identify projects that could be standardized and replicated nationwide, and she also suggested to tap emerging technologies.

- VIVEK VERMA, CHANDIGARH

Hon'ble Chief Minister, Gujarat, launches CM Dashboard 2.0

Features of CM Dashboard 2.0 being demonstrated to the Hon'ble Chief Minister of Gujarat

CM Dashboard 2.0

Shri Vijaybhai Rupani, Hon'ble Chief Minister of Gujarat, launched the CM Dashboard 2.0 during an event held in Gandhinagar on 4th May 2019, on the occasion of successful completion of one year of CM Dashboard 1.0. Shri M.K. Das, IAS, PS to CM, Shri P.V. Mohan Krishnan, DDG & SIO, Shri Anand Shah, Senior Technical Director and Shri Shailesh Khanesha, Senior Systems Analyst, NIC Gujarat, were also present on the occasion.

Developed as a Command and Control Unit, the Dashboard features real time performance measurement with dynamic benchmarking and target setting, Performance Index up to Zone, District and Taluka level, Grading System, Toppers and Laggers Club etc.

Speaking on the occasion, Shri Vijaybhai Rupani said, "This application is 'Third Eye' of the government to monitor various activities of different departments as CCU. This makes the government more productive by achieving good, efficient and transparent governance."

A demonstration of features of the Dashboard was also conducted, and the Hon'ble CM appreciated the efforts of Team NIC Gujarat. In CM Dashboard 2.0, 3000+ indicators, 1200+ authorities, 500+ web services from live systems and 1650+ projects have been monitored daily.

- AMIT DINKERBHAI SHAH, GUJARAT

NIC celebrates 5th International Day of Yoga

Dr. Neeta Verma, DG, NIC, along with Officers, taking part in the Yoga workshop at NIC HQ

NIC Uttar Pradesh

NIC Madhya Pradesh

NIC Punjab

NIC Telangana

NIC Uttarakhand

NIC Bengaluru

NIC Manipur

NIC Goa

Yoga for Harmony & Peace

Yoga, a physical and spiritual practice originated in India, helps achieve inner peace, thereby fostering a balanced living and wellness of the human body. In wake of the 5th International Day of Yoga observed on 21st June 2019, enthusiastic celebrations were held at various NIC locations across the country, and NICians marked the occasion with active participation.

NIC HQ collaborated with the Ministry of Ayush, New Delhi, and celebrated with the theme, 'Festival of Yoga and Wellbeing'. A Yoga workshop was organized wherein Smt. Savita Jain from Sanghamitra, Women Power of NIC, explained the benefits of Yoga and demonstrated various Yoga postures for living a healthier life. The event was broadcasted live through webcast and video conferencing across the country, thereby ensuring its maximum benefit to NICians posted at various Ministries, States and Districts.

On 11th December 2014, the United Nations General Assembly recognized 21st June as the International Day of Yoga, as proposed by Shri Narendra Modi, Hon'ble Prime Minister of India. The day has been celebrated with full gusto across the world since 2015.

- V.K. TYAGI, NIC HQ

# Best Experience Paper Award to Technical Paper by Senior NIC Officers

The International Conference on Theory and Practice of Electronic Governance (ICEGOV) is an annual event coordinated by the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV). The conference provides universities, research centres, governments, industry, and international organizations with a platform to interact and share ideas on best practices in electronic governance beneficial for the society.

Representing NIC in the international arena, the team of NIC Officers, Shri Deepak Chandra Misra, DDG, Smt. Seemantinee Sengupta, Sr. TD, and Shri Omprakash Aggarwal, TD, as well as Shri Marut Chaudhary, Manager, Ernst & Young LLP, was declared winner of the Best Experience Paper Award for their technical paper on "Role

Best Experience Paper Award for Technical Paper

of Technology in Success of Rural Sanitation Revolution in India". The Award was presented at the 12th ICEGOV held in Melbourne, Australia from 3rd to 5th April 2019.

CSI-Nihilent eGovernance Awards 2018
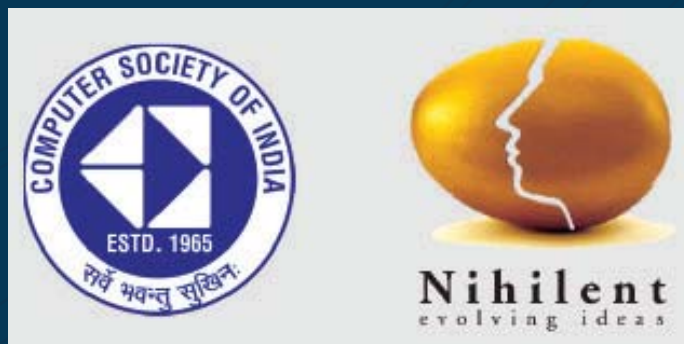
Instituted by Nihilent and the Computer Society of India, CSI – Nihilent e-Governance Awards aim to reward the contributions made by Indian State and Central Governments, Departments and Districts to the field of e-Governance through ICT. Bringing pride to the organization, State Centres, namely NIC Kerala, NIC Haryana, NIC Rajasthan, NIC Delhi, NIC Telangana, NIC Chhattisgarh, NIC Andhra Pradesh, and NIC Gujarat have bagged CSI-Nihilent eGovernance Awards in Projects Category for "SECURE" (Software for Estimate Calculation Using Rural Rates for Employment), "SARAL" (Simple, All Inclusive, Real Time, Action Oriented, Long lasting portal), "Pehchan" (Civil Registration System) & "Gyan Sankalp Portal", "S3WaaS" (Secure, Scalable and Sugamya Website as a Service), "eLaabh", "e-Awas", "Integrated Aadhaar enabled-Supply Chain Management System" and "Computerized Case Monitoring System", respectively.

State Data Centre, Odisha wins CISO MAG Award 2019

Shri A. Mohapatra and Shri S.K. Bhol receiving the Award

An initiative by EC-Council, the world's leading cyber security certification body, CISO MAG Awards recognize innovation, leadership and strategies of professionals and organizations in the field of Cyber Security. Earning laurels to NIC, State Data Centre, Odisha was declared winner of the Best Cloud Initiative of the Year Award for setting up of "GoO Cloud" during a function held at The Westin Mumbai Garden City Hotel in Mumbai on 26th March 2019. Shri A. Mohapatra, OAS, Joint Secretary to E&IT Department, Government of Odisha and Shri S.K. Bhol, Senior Technical Director, NIC & Project Manager, SDC, received the Award from Shri Brijesh Singh, Secretary & Director General, Information & Public Relations Secretary & Special Inspector General of Police Cyber Maharashtra State, Mumbai.